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Pride in Alberta

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Alberta
AGRICULTURE, FOOD AND
RURAL DEVELOPMENT

GRADE 5

a teacher handbook

United Grain Growers was formed in 1906 by a group of prairie farmers. UGG is a farmer owned corporation which has become one of the largest grain handling companies in Canada.

UGG is pleased to join with Alberta Agriculture in the Classroom Program by sponsoring the printing of this resource for educators to use in their classroom.

We endorse the vision of A.I.T.C. which states that through this program and it's resources our future citizens will have a better understanding of the food industry and as a result be informed decision makers.

It is our hope that we can inspire you to integrate an agriculture theme with your science, social studies and language arts curriculum.

Ted Allen

Ted Allen
President
United Grain Growers

UGG

3rd Edition
April 1993 - 1500 copies
For further information contact:

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and Rural Development
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Community Services Branch
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Edmonton, Alberta T6H 5T6

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PRIDE IN ALBERTA

A Resource Book For Teachers

Division 2

(Language Arts, Social Studies, Science)

Alberta Agriculture, Food
and Rural Development
1993

CREDITS

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Thanks for Comments:	To all teachers who evaluated the pilot edition, and to the review committee from Alberta Education.

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INTRODUCTION

You are invited to use the material in this handbook in your everyday classroom planning and activities. The integrated lessons use a whole language approach for investigating and participating in social studies and science concepts which are recommended in the current Alberta Education curriculum.

This is the second edition of Pride in Alberta. Revisions have been made to the pilot edition which I hope will reflect the concerns of teachers who evaluated the activities in their classrooms. Probably the most obvious change is that the format is now three separate handbooks which are designed for individual grade levels. I would, however, encourage teachers who may wish to borrow lessons not specifically designed for this grade level to do so. These activities are intended to be modified and adapted to your special needs and the particular needs and interests of your students. Many educators who have attended workshops which highlight these handbooks have expressed the usefulness of the handbooks for enrichment and split classes. I sincerely hope that they can be used effectively in your classrooms.

To assist you in the use of this resource, I would like to draw your attention to a few of the features of the handbook. First, and probably most useful, is the Curriculum Connection Chart. Use this to select activities for particular subjects and topics. This will give you an overview of the handbook and should help you to include some of this material in your overall plan. Second, each activity includes a covering lesson summary which should further clarify the activity including objectives and materials required. Lesson plans and resources should make for simplified preparation and execution. The student worksheets are intended to be used as thought and activity organizers rather than a workbook approach to seat work. These may be most effectively used in organizing student group work and the planning of independent work or tasks.

Alberta Agriculture film library and publications library may have some additional relevant resources. You are encouraged to write for a publication list and a film catalogue.

Alberta Agriculture, Food
and Rural Development
Publications Office
or
Film Library
7000 - 113 St.
Edmonton, Alberta
T6H 5T6

The original writing and subsequent revision of this resource has been a most enlightening experience. I have re-established communications with classroom teachers while increasing my understanding of the significant role of agriculture in Alberta society in the past, for the present, and in the future. Work with the Ag. in the Classroom Program has been an exciting experience. I hope that the enthusiasm I feel personally is reflected in the presentation of the following activities.

ACTIVITY OUTLINE

Individual activities in this book have been written in a standard way and each one includes the following sections:

1. **The Title**
2. **Study Question** - a question to focus the activity; try to answer it before going ahead.
3. **The Activity** - a concise statement of what students do.
4. **Curriculum Fit** - suggests which subject is emphasized in the activity and gives you a precise reference to curriculum statements found in your provincial curriculum guides for Language Arts, Social Studies and Science.
5. **Agriculture Concepts** - suggests what students will learn about agriculture.
6. **Purpose** - a brief description of the goal behind the activity.
7. **Materials Required** - a list of materials you will need for the activity.
8. **Time Required** - estimated time needed to complete the activity.
9. **Background -- For the Teacher** - a brief overview of the activity and sometimes needed background information for completion of the activity.
10. **Procedure** - a brief description of suggested steps to follow in introducing, carrying out, and concluding the activity; marginal notations highlight the steps and reflect the curriculum areas.
11. **Discussion Questions** - a brief list of questions that can be used in a discussion.
12. **Related Activities** - additional activities that grow out of the main activity, but may require additional resources as well as time.
13. **Resource Sheets** - resource material for student and teacher use:
    - pictures
    - information sheets which provide some background for the activities
    - samples of student activity sheets

symbol that marks all student resource material

symbol that marks all information sheets or other material for the teachers

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11. **Energy Conversion** 11.1
Students match farming activities with food chain components.

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Students evaluate and compare agriculture power.

13. **Irrigation** 13.1
Students build a working irrigation system.

14. **Learning The Language** 14.1
Students build vocabulary.

15. **The Future of The Family Farm** 15.1
Students role play a modern farm family dilemma.

16. **Math Teasers** 16.1
Solving math problems related to agriculture.

LIST OF RESOURCES

Activity 10 - OUR HERITAGE, OUR FUTURE
- Photographs

Activity 11 - ENERGY CONVERSION
- Egg Production - student resource
- Ranching - student resource
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- From Seed to Feed - student resource
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Activity 12 - POWER
- Butter Production Process - student resource
- Discover Power - suggested projects - teacher resource
- Farm Power Compared - teacher resource
- Agriculture and the Provincial Economy
- Net Value of Production - a table
- Employment in Commodity Production - a table
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Activity 13 - IRRIGATION
- Soil Test Experiment - teacher resource
- Agricultural Irrigation - teacher resource
- Photographs

Activity 14 - LEARNING THE LANGUAGE
- Learning the Language - student resource
- Crossword answers - teacher resource
- Photographs

Activity 15 - THE FUTURE OF THE FAMILY FARM
- The Dilemma - student resource
- The Setting - student resource
- Rural Population and Farm Size - teacher resource
- Photographs

THE WORKSHEETS

Activity 11- Energy Conversion

Farming and the Food Chain

Activity 12 - Power

Butter Production Compared

Activity 14 - Learning the Language

Agricultural Crossword Puzzle

Activity 16 - Math Teasers

Math Teasers

CURRICULUM CONNECTION

PRIDE IN ALBERTA - GRADE FIVE

LESSON TITLE	SUBJECT AREA	CURRICULUM CONNECTION	MAJOR AGRICULTURAL CONCEPTS	MAJOR CONCEPTS	RELATED SUBJECT SKILLS
10. Our Heritage, Our Future	Social Studies	Alberta, Past, Present, Future: Technology. Canada: Industrial Development from Region to Region - industry, standard of living and employment.	Capital and Technology Intensive Nature of Agriculture. Diversity. Economic Importance. Importance of Soil and Water.	Change vs. constancy.	Language Arts
11. Energy Conversion	Science	Matter and Energy. Chemical changes in matter. Energy resources. Conservation of energy resources.	Production, Processing and Marketing Systems.	Responsible use of energy. Examples of energy forms and uses.	Language Arts
12. Power	Science	Matter and Energy. Energy resources and conservation.	Capital and Technology Intensive Nature of Agriculture.	Energy sources guide. Industrial and technical developments.	Social Studies
13. Irrigation	Science	Earth, Space and Time. Water and Land.	Capital and Technology Intensive Nature of Agriculture. Importance of Soil and Water. Economic Importance.	The relationship of land productivity to soil and water. Vegetation requires water.	Art Building and Construction

PRIDE IN ALBERTA - GRADE FIVE

LESSON TITLE	SUBJECT AREA	CURRICULUM CONNECTION	MAJOR AGRICULTURAL CONCEPTS	MAJOR CONCEPTS	RELATED SUBJECT SKILLS
14. Learning the Language	Language Arts	Building vocabulary. Dictionary skills.	Diversity.	Effective communication requires a good vocabulary.	Crossword Puzzle
15. The Future of the Family Farm	Language Arts Social Studies	Development of speaking skills - expressing orally explanations, preferences, feelings, judgements, emotions, predictions. Alberta, Past, Present, Future: Change.	Economic Importance. Capital and Technology Intensive Nature of Agriculture.	Rural communities are affected by movement of families off Alberta farms.	Drama Social Studies
16. Math Teasers	Mathematics	Basic arithmetic skills and problem solving.	Economic Importance. Production, Processing and Marketing Systems. Diversity.	Math skills are required in agribusiness.	Language Arts

Activity 10

OUR HERITAGE, OUR FUTURE

STUDY QUESTION:	What new things might I be able to order in a restaurant 50 years from now?
THE ACTIVITY:	Students imagine the future trends and developments in agriculture technology.
CURRICULUM FIT:	**SOCIAL STUDIES** ● Alberta, Past, Present, Future: Technology. ● Canada: Industrial Development from Region to Region - industry, standard of living, employment. **MAJOR CONCEPTS** ● Change vs. constancy. **LESSON CONCEPTS** ● Some things are constantly changing. Some things remain the same. Both of these may be related to the same industry. ● In agriculture, we have been producing essentially the same products for many years, however, the technology used in management and production is ever changing.
AGRICULTURE CONCEPTS:	Capital and Technology Intensive Nature of Agriculture Diversity Economic Importance Importance of Soil and Water
PURPOSE:	○ To learn how technology has changed man's activities on the farm. ○ To speculate how agricultural technology may change in the future.
MATERIALS REQUIRED:	Supplied in this lesson.
TIME REQUIRED:	1 - 2 class periods.

BACKGROUND - For the Teacher

The concepts of change and constancy are opposite. How can both of these concepts be applied to the same industry?

Example: Heat is required for cooking. The requirement of heat is constant, while the source of the heat may vary greatly. We may not even know what some of the sources of heat will be in the future.

In this lesson, we will look at two ordinary food products that we are all familiar with and eat often. We will see how the technology used in the production of these foods has changed, and we will see if we can predict some of the changes in this technology in the future.

PROCEDURE

Part 1
Introduction

1. Review the concepts of change and constancy.

Part 2
Collecting Facts

2. The class may be divided in half. One group would investigate egg production, and the other, milk production.
3. Show the class the pictures of the old methods employed in each operation. Ask them to suggest things they know about egg and milk production 75 years ago.
4. Show the class the pictures of the modern technology used in both of these operations. Discuss how things have changed.

Part 3
Making Predictions

5. Ask each group to imagine how these operations may change even more over the next 75 years. What might change for the farmer?
6. Have each individual or group draw a picture or make a model of a dairy or egg production operation of the future.

Part 4
Conclusion

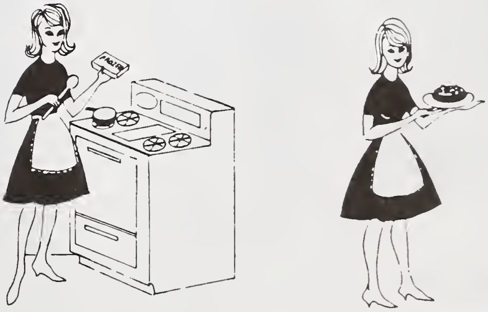
7. Explain or demonstrate your technology of the future to the class.

FOR DISCUSSION

1. What sources of power will be used in the future?
2. How will the ratio of product to man hours change?
3. Will artificial substitutes ever be used in place of these two food items? Are substitutes used today?

RELATED ACTIVITIES

1. Choose another industry and find out how its technology has changed.
2. Compare the advances in agriculture technology to those in the auto industry.
3. Tour a modern dairy or poultry farm.
4. Do a taste test comparing milk to a milk substitute, and eggs to an egg substitute.



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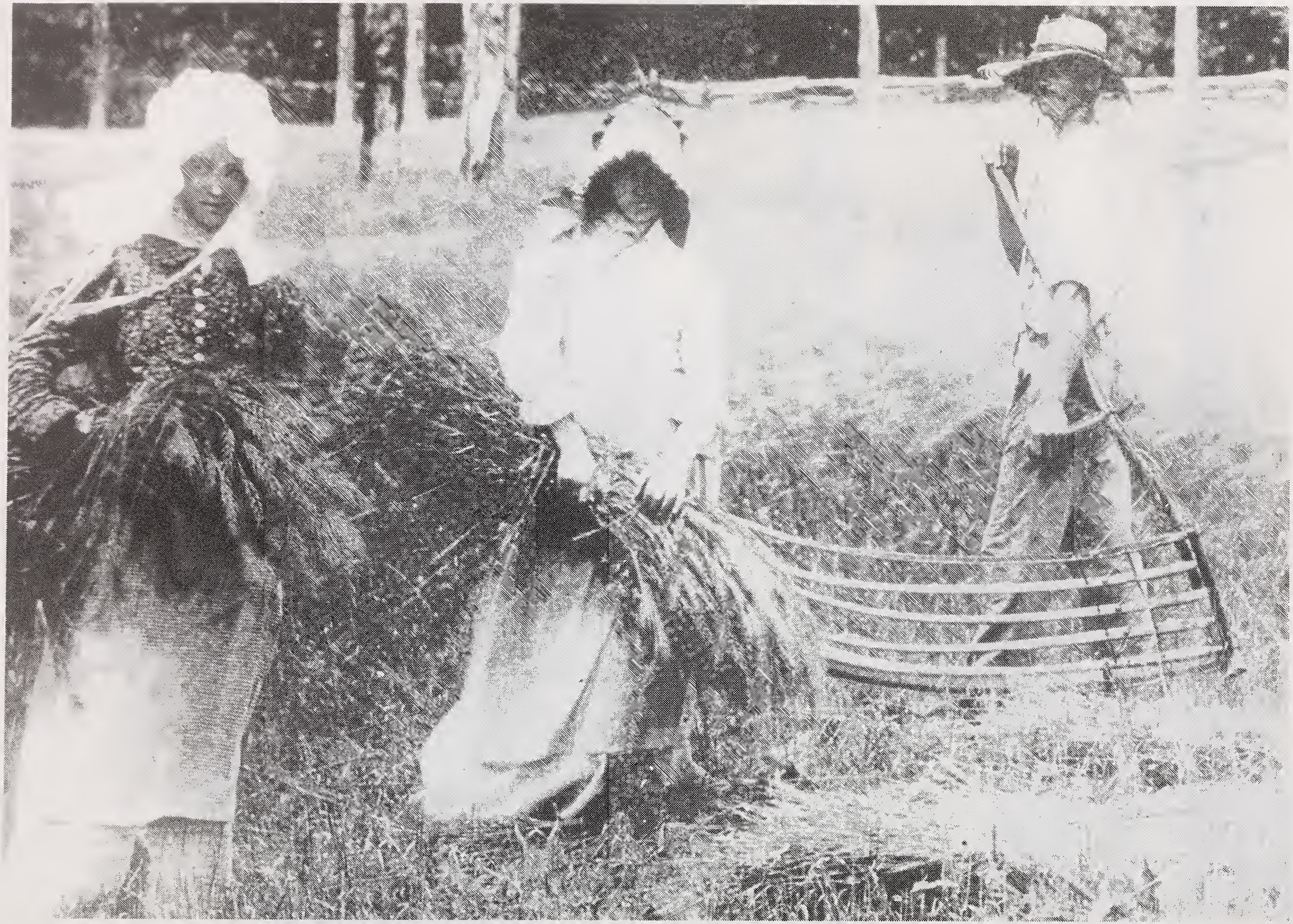

Cradle - Early Harvesting. 1906 A1615.
Provincial Archives of Alberta

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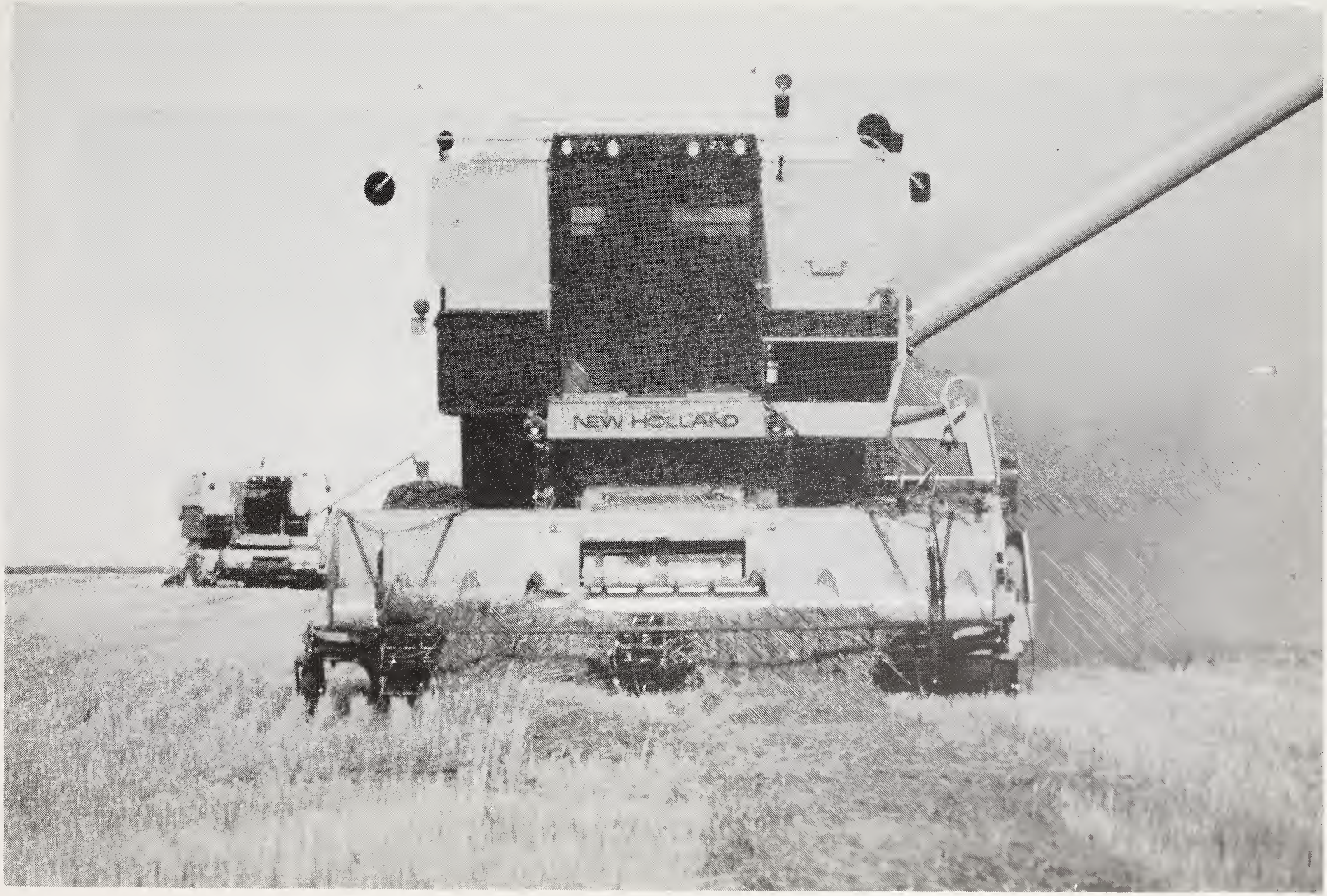
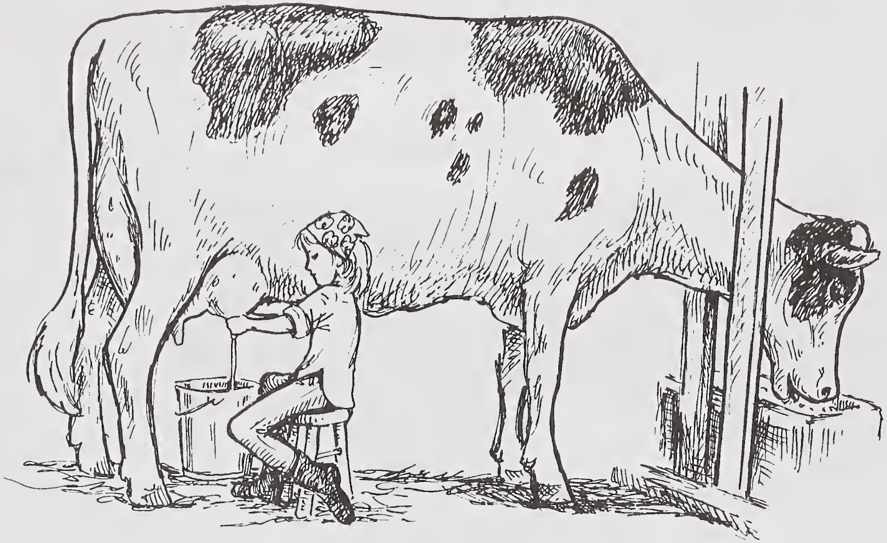


Modern Harvesting

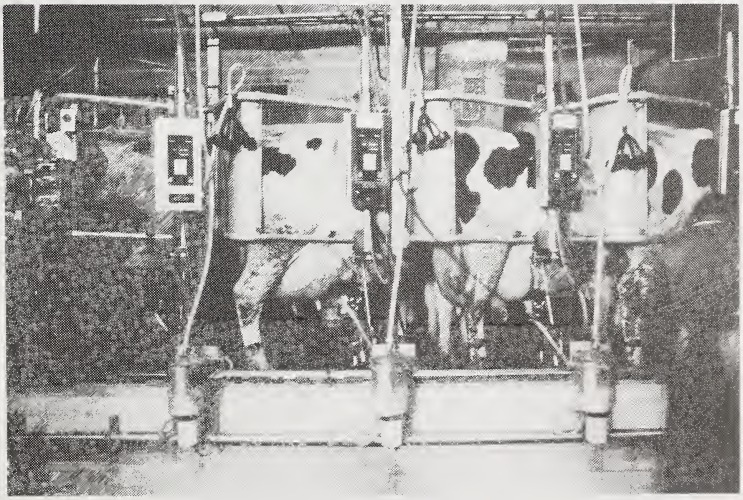
MILKING COWS



THEN

Hand milking

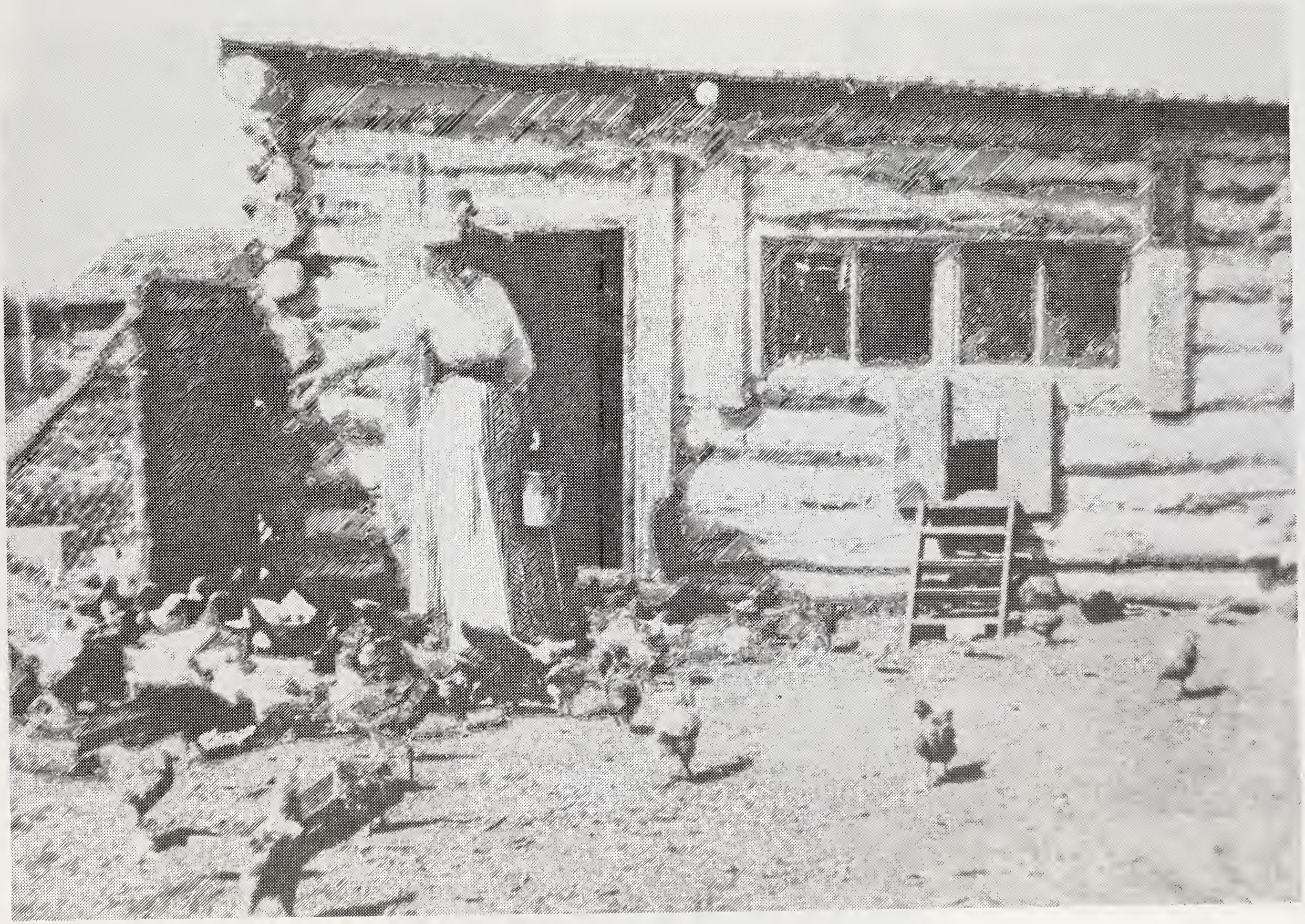
NOW



Modern Milking Parlour

Changes in Egg Production

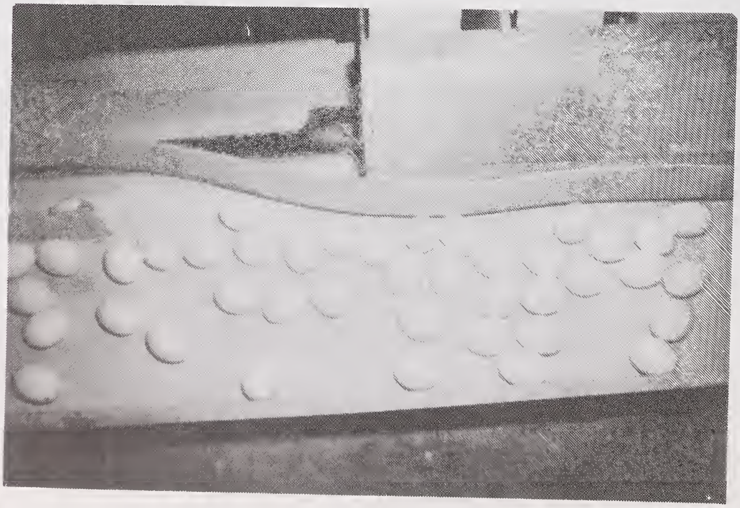
THEN

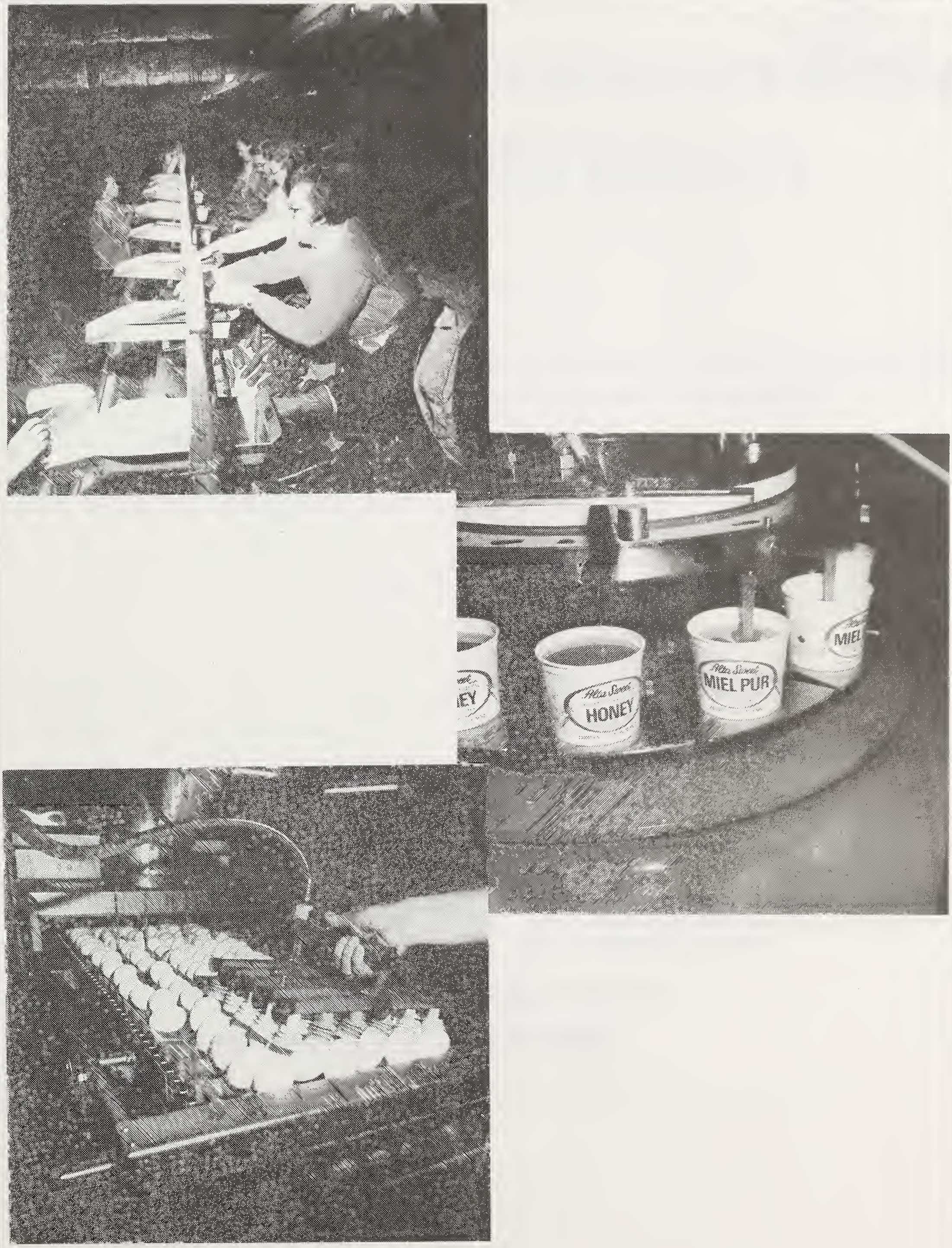


Chicken Coop. Villeneuve 1907. A 7693.
Provincial Archives of Alberta.

NOW

Laying hens are kept in small pens. The eggs roll out on to the conveyor belt.





Food processing.
The teamwork of people and technology.

Activity 11

ENERGY CONVERSION

STUDY QUESTION: I have seen a model of a food chain. If the farmer produces my food, how does he fit into the model?

THE ACTIVITY: Students match farming activities with food chain components.

CURRICULUM FIT:

SCIENCE
- ● Matter and Energy.
- ● Chemical changes in matter.
- ● Energy resources.
- ● Conservation of energy resources.

MAJOR CONCEPTS
- ● Responsible use of energy.
- ● Examples of energy forms and uses.

LESSON CONCEPTS
- ● Farming practices have a direct influence on the process of energy conversion.
- ● Many farm activities support our food chain.

AGRICULTURE CONCEPTS: Production, Processing and Marketing System

PURPOSE:
- ○ To show how man manages the food chain for his benefit.
- ○ To understand how farming practices are related to the food chain and the energy flow.

MATERIALS REQUIRED: Supplied in this lesson.

TIME REQUIRED: 2 class periods.

BACKGROUND - For the Teacher

All living things depend on energy in one form or another. The primary source of energy on earth is the sun. The sun generates what is called solar energy. All other forms of energy in living systems originate with solar energy.

Gas, oil and coal are fossil fuels that had their beginning millions of years ago. They were once expansive forests that died, decayed, and were finally compressed by millions of years of overlying deposits. But not all energy conversion processes take millions of years. The simple food chain can be completed in a few hours.

The food chain is the result of solar energy being progressively changed from one form of energy to another to provide nutrition for plants and animals. Through photosynthesis, plants are able to use solar energy directly to manufacture food which is, in turn, suitable for some animals. These animals, which we call herbivores, convert this high fibre energy into higher quality protein food that is required by other animals, carnivores, and by humans. Because we eat both plants and animals, people are often called omnivores.

Man's increasing need for both plant and animal energy sources has led him to take a hand in the food chain. Efforts to increase the efficiency of this natural cycle have resulted in one of the world's oldest and most essential industries - agriculture.

The fact that all living things are interdependent makes it necessary for man to participate in the natural cycles which affect his life. In this exercise you will discover which farming activities are directly related to the production of energy.

PROCEDURE

Part 1
Introduction

1. Introduce the concept of energy production and use.
2. Ask the students to name as many different kinds of energy that they can think of.
3. Focus the discussion on food energy. How is solar energy changed into a useable fuel for people?
4. Borrow the film "Sun Changers" from the Alberta Agriculture film library and show it to your class.

Part 2
Understanding Ideas

5. Discuss the film and the following ideas:
    a) What is a food chain? (Give several examples.)
    b) Is man a part of a food chain? Does man eat food? Then he must be a part of a food chain.
    c) How does man influence his food chain by farming? (Raising plants and animals for food.)
        - Farmers help the food chain by helping plants and animals to grow and mature.
        - Some plants provide food for animals.
        - Some plants provide food for man.
        - Some animals provide food for man.

6. There are many kinds of farmers in Alberta. On the board, make a list of farm operations. This may include the following:
    - Dairy farmers raise and milk cows to give us milk and milk products.
    - Poultry farmers raise chickens and other birds for meat and eggs.
    - Beef farmers raise cattle for meat production.
    - Grain farmers grow grains for cereal, bread, vegetable oil, beer, and animal feed.

Part 3
The Activity

7. Divide the students into four groups.
8. Give each group a copy of the Food Chain Worksheet.
9. Give each group one of the four farming operation fact sheets and ask them to decide which farming activities listed on their fact sheet support the links in the food chain.
10. Have students do the Farming and Food Chain worksheet.
11. Have each group make a simple cartoon or flow chart to show the links in the food chain that their farmer is involved with.

Part 4
Conclusion

12. It is important to plan an effective conclusion to this lesson. Using the flow chart of the farm operation, explain how the various activities affect energy production. The points where energy is actually converted to a new form are designated.
13. Ask the students what the consequences would be of omitting one or more of the steps. Students should be able to see that most of the steps influence the quantity and quality of the end product.

FOR DISCUSSION

1. Is there any way that we influence the food chain in our daily lives?
2. How is energy conversion managed by a farmer?
3. How does this compare to a natural energy flow?

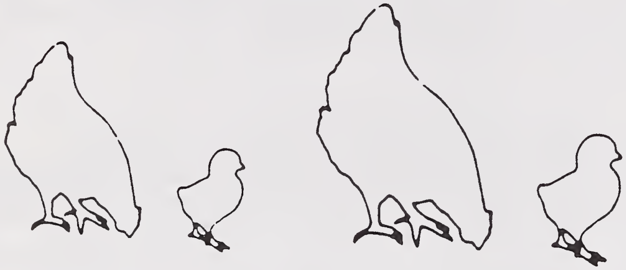
RELATED ACTIVITIES

1. Make a list of the by-products which are the result of agricultural production of food.
2. Grow four edible plants; two in the classroom and two outside. Take special care of the classroom plants and leave the others to nature. Which grows the best? Why?
3. Visit a well organized farm for a guided tour of typical farm activities.

OPTIONAL RESOURCE MATERIALS

The film “The Sun Changers” available from the Department of Agriculture, Food and Rural Development.

Egg Production



Some typical activities:

- Selection of good quality birds
- Facility cleaning
- Feed preparation
- Hatching
- Feeding and watering
- Disease control
- Egg grading
- Egg collection
- Spreading manure on cropland

STUDENT RESOURCE

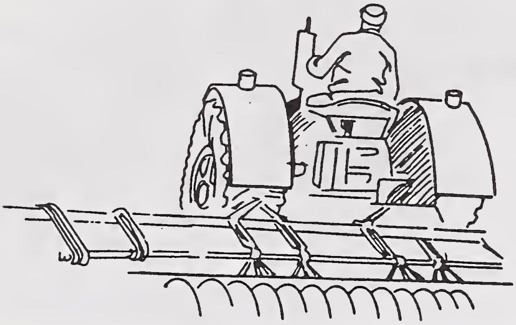
Ranching

Some typical activities:

- Growing feed for winter
- Fence building
- Weed control
- Selling animals to market
- Winter feeding
- Supervision during calving
- Health care
- Watering
- Selective breeding
- Herding stock from pasture to pasture

STUDENT RESOURCE

Grain Production

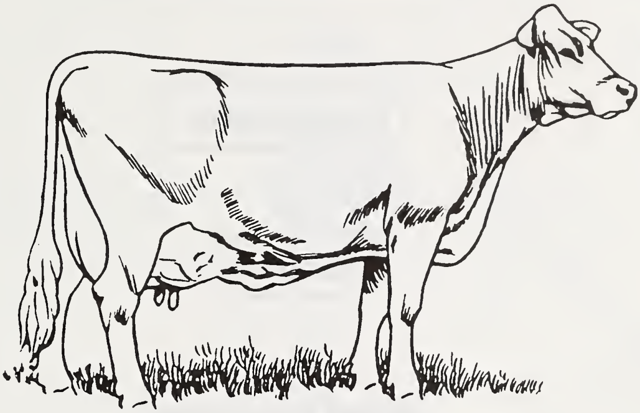


Some typical activities:

- Weed control
- Seed selection and cleaning
- Machinery repair
- Disease control
- Harvesting
- Seeding the crop
- Cultivation of the land
- Pest control
- Irrigation
- Fertilizing the land

STUDENT RESOURCE

Dairy Operation



Some typical activities:

Care and raising of young animals

Selective breeding

Growing hay and grain for feed

Milking

Feeding and watering

Cleaning milking equipment

Cleaning barns and yards

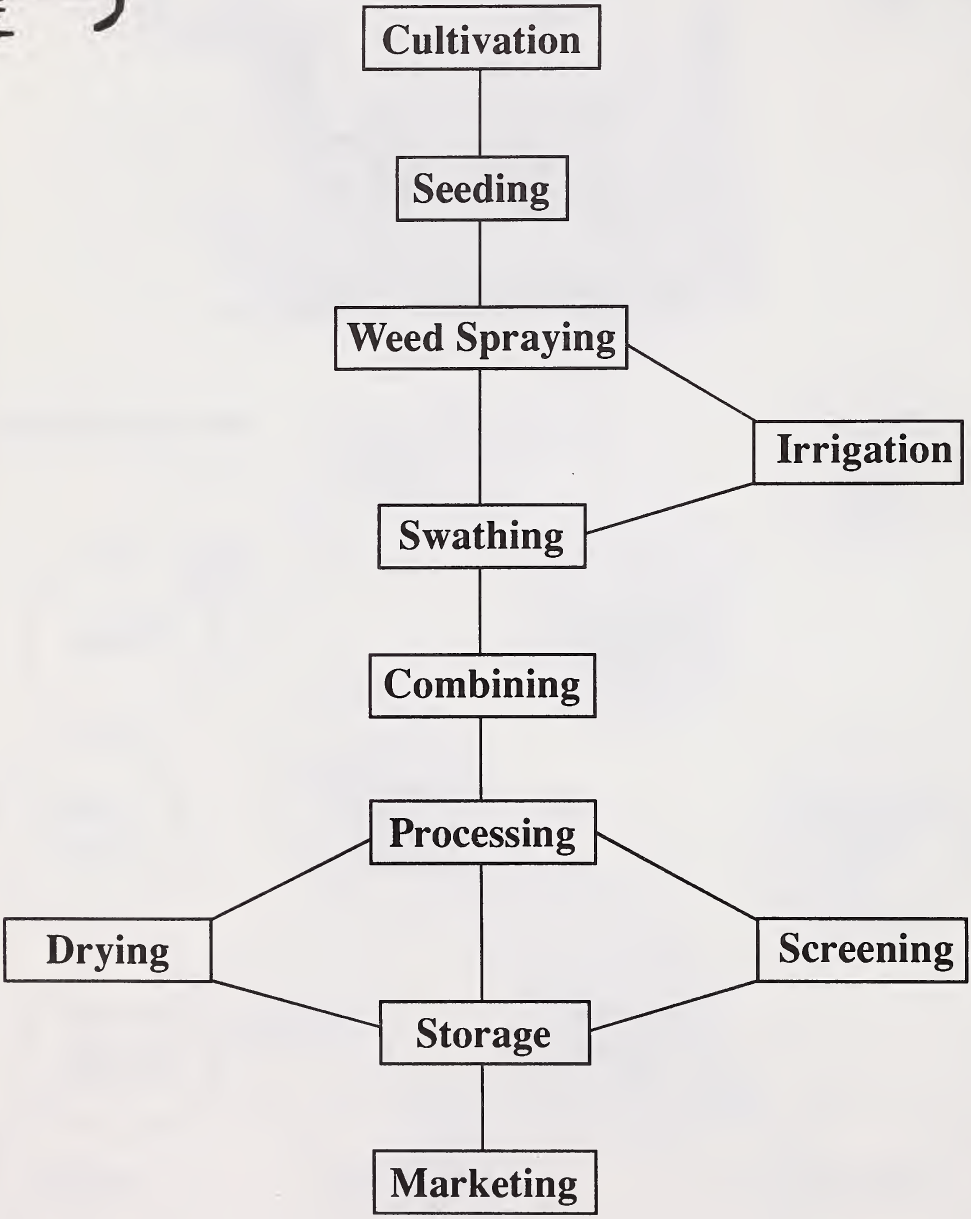
Spreading manure on crop land

Health care

Supervision of calving

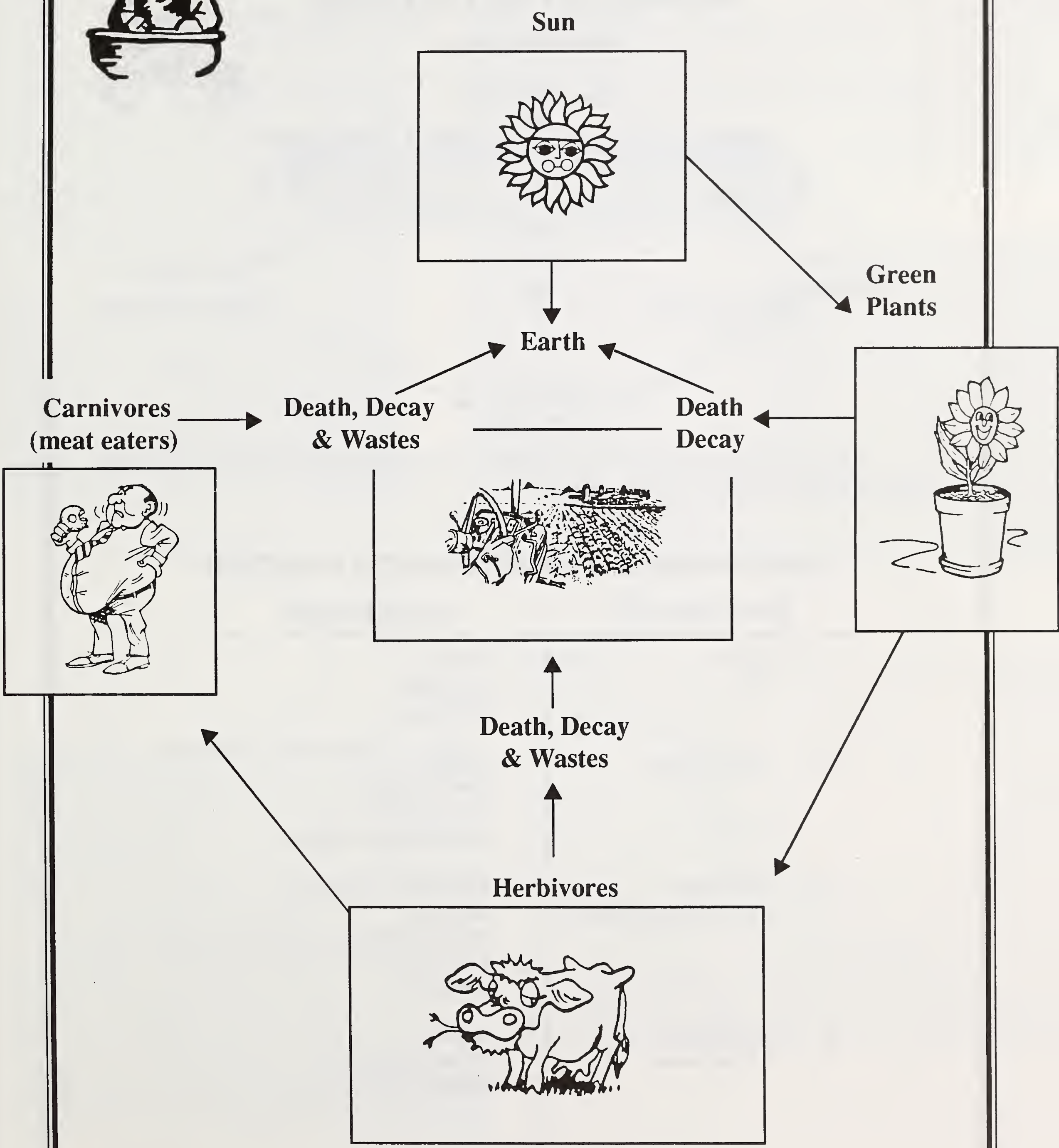
STUDENT RESOURCE

From Feed to Seed



STUDENT RESOURCE

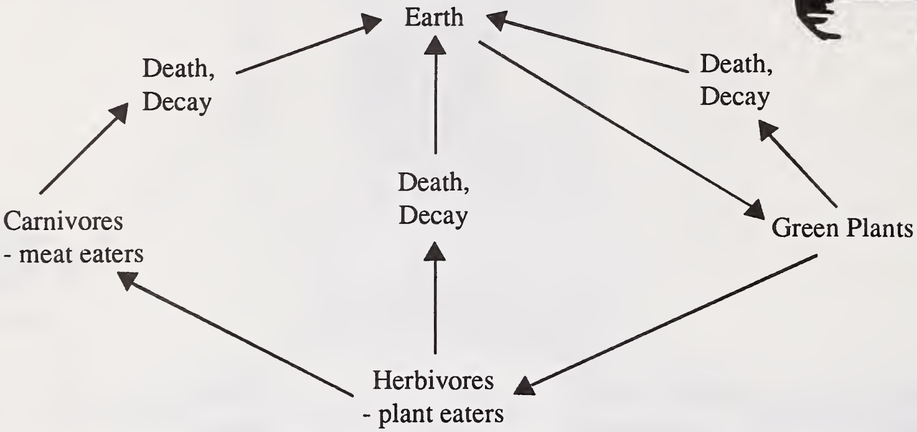
Food Chain



FACT SHEET --

Farming and the Food Chain

Simple Food Chain



This information will help you to complete your worksheet. Read carefully and then start to fill in the blanks on your worksheet.

UNDERSTANDING HOW FARMERS HELP THE FOOD CHAIN

Food Chain Link	Activity Example
1. Earth	- irrigation - cultivation - fertilization
2. Green Plants	- seeding - growing crops - harvesting - weed and pest control
3. Herbivores - plant eating animals	- feeding and watering - hatching - disease control - animal care - breeding
4. Carnivores - meat eaters	- milking - collecting eggs - marketing animals

Worksheet

Farming and the Food Chain

Type of farm operation ____________________

Fill in the farm activities on your farm operation that support the following food chain links.

> ***NOTE***
> ***Your operation may not support all of the links.***

Food Chain Link **Farm Activities**

1. Earth

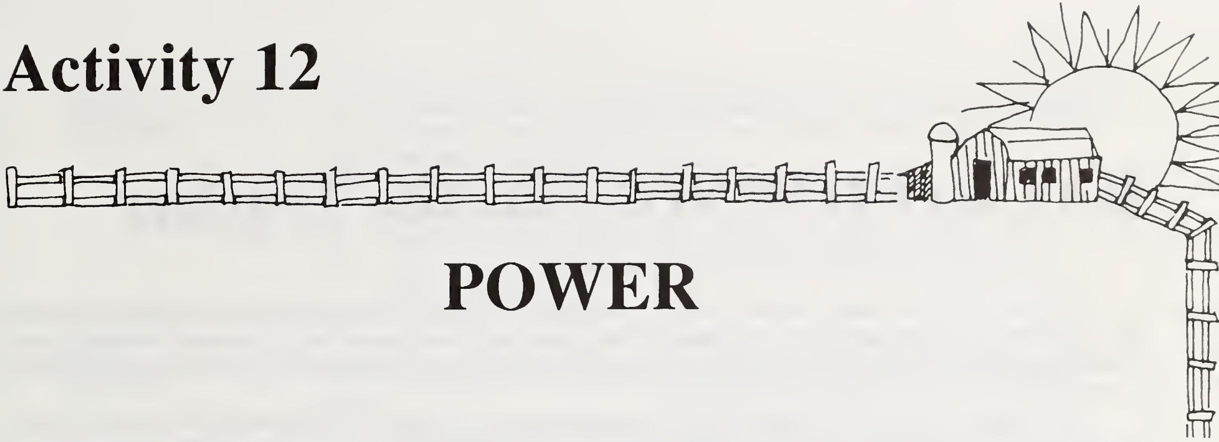
2. Green Plants

3. Herbivores (plant eaters)

4. Carnivores (meat eaters)

From Seed to Feed

Activity 12



POWER

STUDY QUESTION:	Why don't people dig ditches like they used to?
THE ACTIVITY:	Students evaluate and compare agricultural power sources as renewable and non-renewable resources.
CURRICULUM FIT:	**SCIENCE** ● Matter and Energy. ● Energy resources and conservation. **MAJOR CONCEPT** ● Energy sources guide industrial and technical development. **LESSON CONCEPT** ● Energy has been necessary in the past, is necessary today, and will be necessary in the future. Development of most industries has been strongly influenced by energy sources. The sources of energy to accomplish our work are changing. Are they renewable or non-renewable?
AGRICULTURE CONCEPTS:	Capital and Technology Intensive Nature of Agriculture
PURPOSE:	○ To compare power and fuels used in the development of the agriculture industry in Alberta.
MATERIALS REQUIRED:	Supplied in this lesson.
TIME REQUIRED:	1 class period.

BACKGROUND - For the Teacher

Agriculture is a very energy intensive industry. Because of the energy required by physical working of the land and the chores related to animal production or husbandry, farmers have sought more power from sophisticated machines to assist them with farm labour. In this exercise students will be asked to evaluate some of the forms of power and the fuels they consume as to their efficiency, ease of use, and renewability.

The fuel that we grow is renewable. Some of the materials required to produce this fuel are **not** renewable. Today we require more and more power to do work. Industries of the past depended largely on animals, human labour, or water power. They are now dependent on high energy natural resources such as gas and oil.

In this exercise we will look at the various sources of farm power that have been used in Alberta in the last 100 years.

There are two separate activities outlined in this lesson. One only, or both, will prepare students for the conclusion and discussion questions. In addition, a list of tasks are provided which may be given to groups of students or individuals who wish to explore the question of power in more detail.

PROCEDURE

Part 1

Introduction

1. Begin by asking the class to define Power by answering some of the following questions:

Discovering power

a) What makes power?
b) What can it do for us?
c) What are some capabilities of your own physical powers? (walking, running)
d) By using tools we can increase our personal power. Examples: rakes, hammers, etc.
e) All power or energy requires fuel. What is our source of fuel?
f) Various foods have different amounts of energy content. What is a high energy food? (sugar) Does sugar supply all of our needs? Why not?
g) We eat food to supply our bodies with energy. This gives us power. Can you think of any other sources of power that humans use, and that they grow food or fuel for? (animals - feed, steam - wood)

Part 2

Making Comparisons

2. Look at the flow chart that illustrates butter making. "Butter Production Compared, 1900 and 1985".

The processes in butter production are identified by numbered boxes. Notice that the processes are identical in 1900 and 1985. However, the power and fuels used to do the same work are very different.

3. On the work sheet, try to fill in the power and fuel sources for each of the processes used in butter production in 1900 and 1985.

Note: Identify the fuel used to generate power for work done which does not produce the milk. See the example on the work sheet.

Gathering Information

4. Have the students study the historical pictures provided with this lesson. They depict various sources of farm power which have been used on Alberta farms in the past.
5. Ask the students to do the following tasks:
   a) Identify the source of power for each illustration. (fuel)
   b) Describe the activity shown.
   c) Decide if the fuel required in each case is a renewable resource.
   d) Choose which of these power sources are the most efficient and which are the least efficient.

Part 3
Conclusion

6. With the class, show the steps of the production and processing of their breakfast cereal.

   This can be a quick flow chart on the black board. Have them identify the areas where power is required and ask them to suggest what fuels are used.

FOR DISCUSSION

1. From a conservation point of view, which of the power sources discussed in this lesson would be best?
2. Why don't we use power sources that are totally renewable?
3. Take a look at the following chart of power used on farms. Notice the various fuel sources and pay particular attention to whether the fuel is a renewable resource or not. How much energy is generated?

RELATED ACTIVITIES

1. Make a collage of pictures of farm activities using various forms of power.
2. Assemble a collection of simple machines and note their efficiency.
3. Try to build a simple machine that uses each of the following for power - hand, wind and water.

Worksheet

Butter Production Compared

Fill in the power source and fuel required for both charts. Number 1 is done for you.

BUTTER PRODUCTION 1900

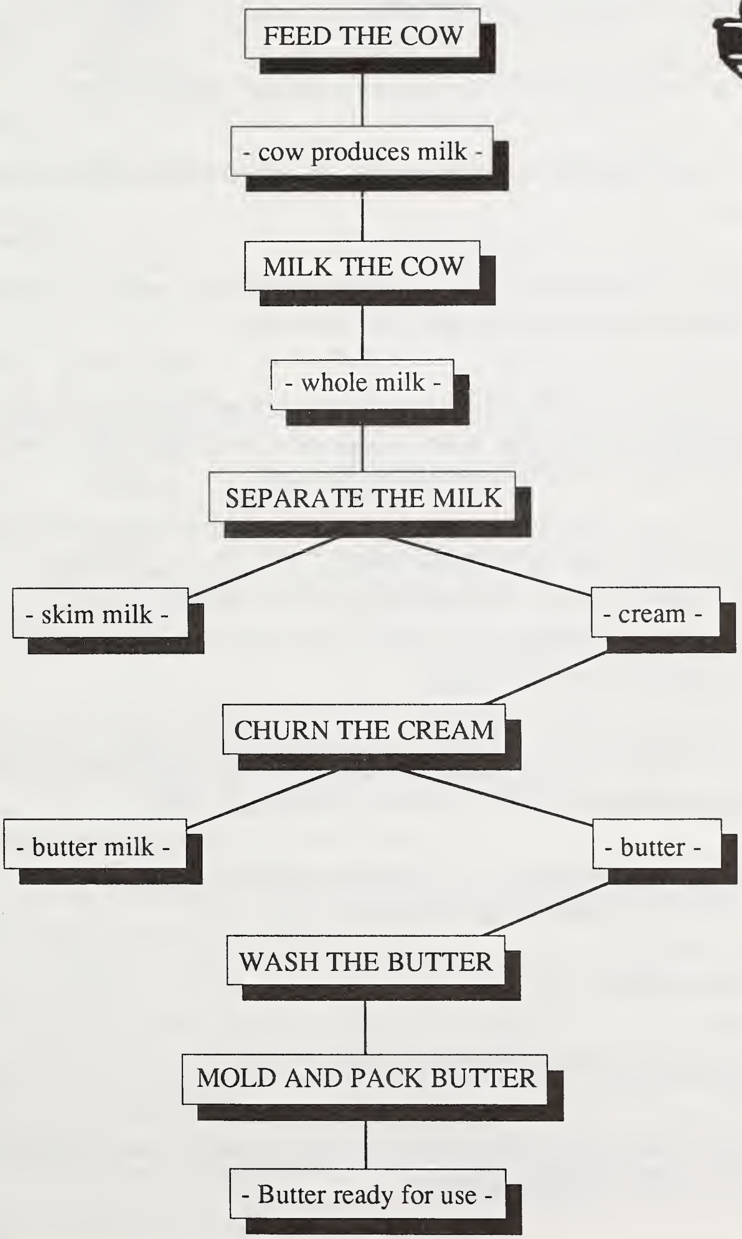
	POWER SOURCE	FUEL REQUIRED
1. Feed the cow	- human labour	- human food
2. Milk the cow		
3. Separate the milk		
4. Churn the cream		
5. Wash the butter		
6. Mold and pack the butter		

BUTTER PRODUCTION 1985

	POWER SOURCE	FUEL REQUIRED
1. Feed the cow	- machine labour	- fossil fuel (gas, oil)
2. Milk the cow		
3. Separate the milk		
4. Churn the cream		
5. Wash the butter		
6. Mold and pack the butter		

STUDENT RESOURCE

Butter Production Process 1900 or 1987



TEACHER RESOURCE

Discover Power

Suggested student projects:

1. Make a list of 3 wind powered machines.

   (Knowledge)

2. Locate the source of power in the pictures provided in the hand book.

   (Knowledge)

3. Explain how one of these machines works. Be sure to discuss power, function, and efficiency.

   (Comprehension)

4. Arrange the pictures of farm work in chronological order. Make a time line to show when each may have been practised on Alberta farms.

   (Application)

5. Compare the cost of modern tractors to the cost of a two yoke team of oxen. Try to make the adjustment of dollar value by finding out the price of some standard item (ie. 1 dozen eggs in 1900 compared to $1.35 today).

   Compare the work that can be done by each of these power sources in 1 day.
   Team oxen can provide the power to plough _______________ per day.
   Medium size diesel tractor can provide the power to plough ______________ per day.

   2 yoke of oxen cost $260.00
   Medium size tractor cost $60,000.00

   (Analysis)

6. Build a working model of a wagon out of spools of thread and popsicle sticks. Then recommend a source of power to move it from place to place.

   (Synthesis)

7. Rank the sources of power that are given in the illustrations as to:
   a) the amount of work that can be done in 1 day.
   b) the cost of fuel.
   c) the ease of repair.

   (Evaluation)

8. Recommend a use for solar energy on a farm.

   (Evaluation)

9. Choose the most modern source of power from the pictures in the handbook. What is the most primitive source of power?

   (Evaluation)

Farm Power Compared

Power	Fuel Source or Source	Renewable Fuel	Type of Energy Generated
Human	Food (meat, vegetables)	Yes	Very low, power, inefficient
Draft Animal	Hay, Grain	Yes	Low power - slow
Steam	Coal, Gas, Oil Wood	No Yes	Stationary or slow moving - powerful
Electrical	Wind, Water Gas, Oil, Coal	Yes No	Requires generators or electrical hook ups - good stationary power
Internal Combustion Engine	Gas, Oil Alcohol	No Yes	High energy - very mobile

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Agriculture and the Provincial Economy

From its inception as a province in 1905, Alberta has been a significant agricultural producing area. As a result of the homestead policies pursued by the federal and provincial governments in the first 30 years of Alberta's history, the number of farms grew rapidly.

But since 1931 the farm population has declined from being over half the total provincial population to being only 10% of that population today.

The trend toward larger farms and the movement off the land has been accompanied by a major shift in the structure of the provincial economy from being basically agricultural to being dominated by mineral development, especially petroleum.

While no longer responsible for the commodity bringing the most revenue to the province, agriculture still occupies a position of major importance in the economy of Alberta and Canada.

Thus although agricultural production (farm receipts) accounts for only 8% of the dollar value of all goods produced in Alberta, processing and transporting these goods and the sale of chemicals, fertilizer, machinery, providing storage facilities, et cetera, which are associated with farm output, provides for a great deal of additional economic activity. In the final analysis about one half of the gross provincial product is directly or indirectly related to agriculture. The largest of these agriculture related industries is the food and beverage segment which accounts for 24% of the value of all shipments. As well as being the predominant industry in terms of the value of the goods manufactured, the food and beverage industry has the largest number of employees.

(This Land of Alberta - Alberta Agriculture.)

Net Value of Production in Commodity Producing Industries in Alberta and Canada 1982 - 1983

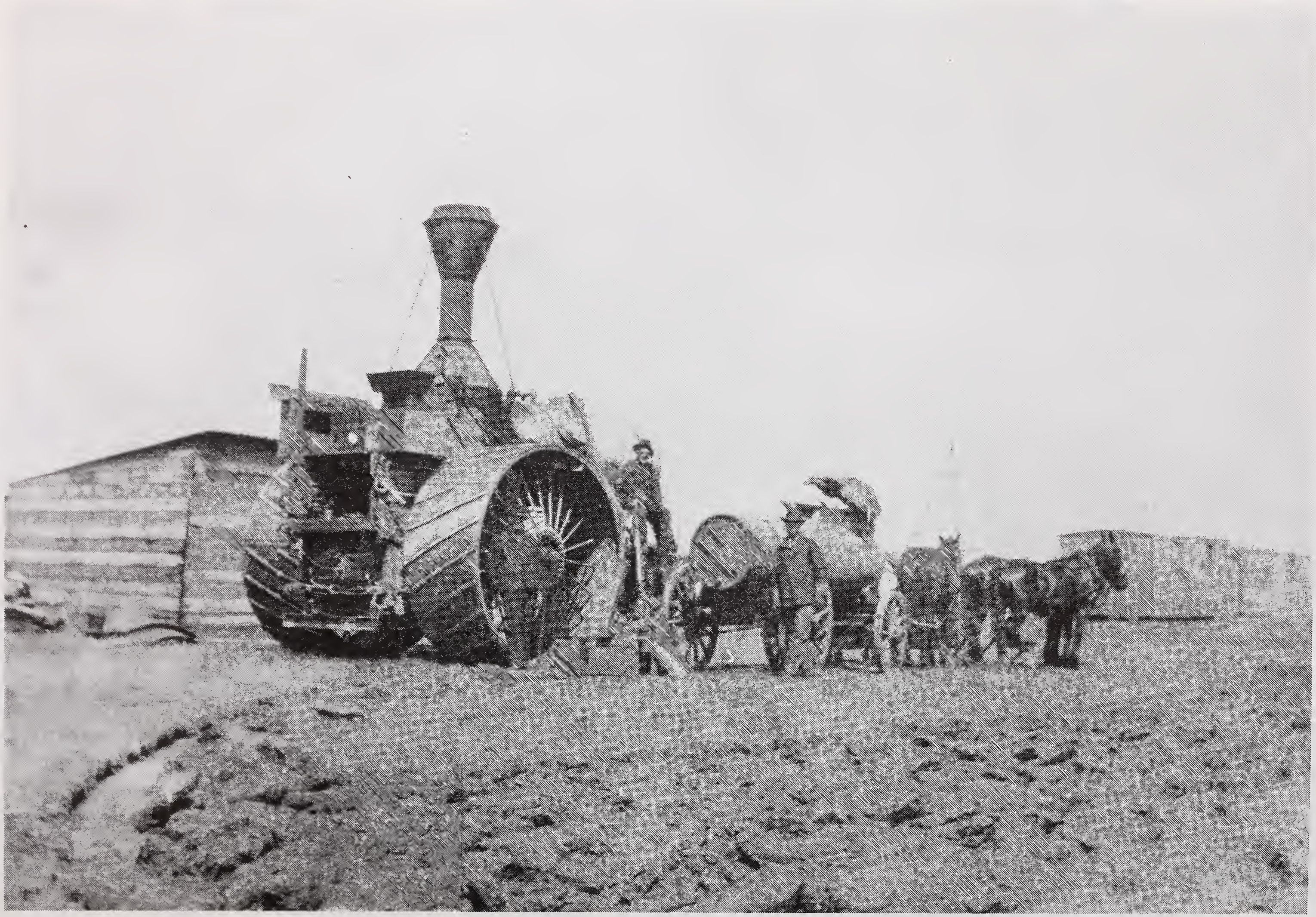
	ALBERTA		CANADA	
	Millions $	**% of Total**	**Millions $**	**% of Total**
Agriculture	1,767	8	9,187	9
Mining (includes petroleum)	14,436	53	20,689	15
Electric Power	1,195	5	12,198	9
Manufacturing	3,265	14	66,771	50
Construction	3,218	20	16,653	15
Other	20		2,963	2
	23,901	100	128,461	100

Employment in Commodity Producing Industries Alberta 1987

INDUSTRY	NO. OF WORKERS	% OF TOTAL PROVINCIAL LABOUR FORCE
Agriculture & Food Processing	106,300	9
Petroleum & Gas	80,600	7
Metal Fabricating	53,600	5
Construction	94,000	8

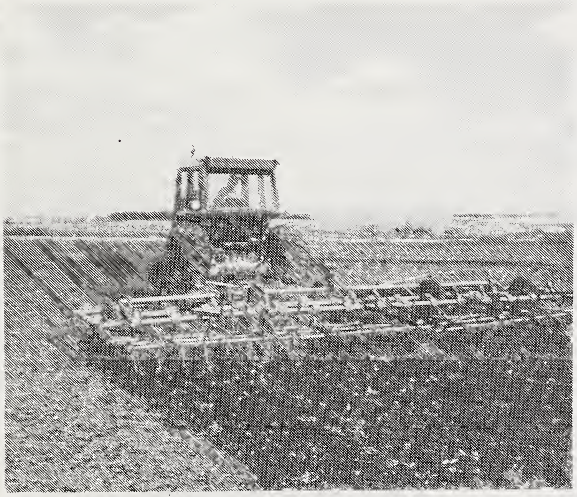
MILKING COWS

CHOPPING WOOD

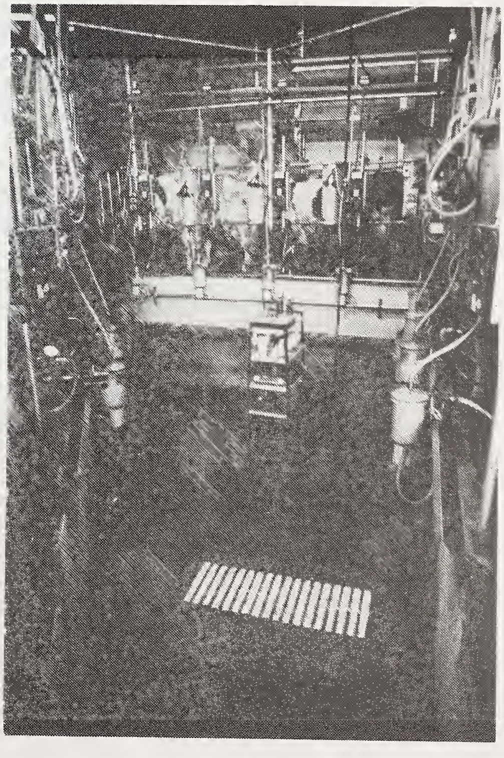


STEAM ENGINE

WINDMILL



FARM POWER



Activity 13

IRRIGATION

STUDY QUESTION:	Isn't irrigation something only farmers do?
THE ACTIVITY:	Students build a working irrigation system.
CURRICULUM FIT:	**SCIENCE** ● Earth, Space, Time. ● Water and Land. **MAJOR CONCEPT** ● The relationship of land productivity to soil and water. **LESSON CONCEPT** ● Vegetation requires water.
AGRICULTURE CONCEPTS:	Capital and Technology Intensive Nature of Agriculture Importance of Soil and Water Economic Importance
PURPOSE:	○ To discover some of the differences in various soil types. ○ To create a student design for construction of a working irrigation system. ○ To participate in taking care of living organisms.
MATERIALS REQUIRED:	Large cardboard box. Coarse sand. Various samples of soil. Grain or small vegetable seeds. Water source. Plastic liner for boxes.
TIME REQUIRED:	2 class periods with some periodic maintenance time.

BACKGROUND - For the Teacher

Irrigation occurs when plants are supplied with water to assist their growth and development. Watering house plants or home gardens is a familiar example of irrigation.

Look at the basic requirements of most plants: water, air, sunlight, soil, and nutrients.

Individual plant species have different needs. Students may understand that cacti require very little water, while some tropical plants can exist in limited light. There are also species of plants that can exist without soil.

The plants that we are concerned with in this lesson are agricultural plants - plants that are grown for food.

Some areas of Alberta are limited in the types of plants that can be grown because of an insufficient rainfall and high velocity drying winds. Under these conditions, in the natural state, only hardy short grasses thrive. If soil conditions permit, the application of water in some of these dry regions can greatly increase the variety and volume of crops that can be grown.

Plants grown indoors can also suffer from drought. Therefore, it is a worthwhile classroom exercise to try an indoor irrigation experiment. In this activity, the students will construct a working model of a surface irrigation system.

PROCEDURE

Part 1
Introduction

1. Discuss with the class the needs of plants.
2. The resource information should provide some suggestions for possible ways to get water to dry agricultural lands.
3. List the various methods of irrigation that one uses in most households.
   - sprinkle lawns
   - surface water plants
   - ground water plants

Part 2
The Project

4. Introduce students particularly to the concept of ditch irrigation and tell them that, as a class project, they will be constructing a working model of ditch irrigation.
5. There are several ways to approach this lesson;
   a) Different groups may build their own models using a variety of soils or seeds.
   b) The entire class may build one model.
   c) Different groups may make various demonstrations of different irrigation methods as suggested in number 3 of the introduction.

Part 3
Construction of Crop Field

6. Use a large, sturdy cardboard box. The base should measure at least 60 cm by 60 cm. Cut the box down to about 30 cm high.
7. Line the box with a single sheet of plastic. This should be strong enough to take a little wear and tear. Staple the liner to the sides of the box.
8. Fill the bottom of the box with about 10 cm of coarse sand. This will prevent flooding of the field.
9. Put loam on top of the sand. This soil is best taken from a natural area. The use of bagged potting soil may result in a mixture that is too porous for the water to run in the channels. The type of soil will greatly affect the success of this activity. It is best to use the Soil Test experiment in order to make the best choice of available soil.

10. Pack the soil into the box quite firmly and form channels in the soil about 7 cm apart. (See the illustration.)
11. Set the box on a board and prop it at a slight angle. (About 3-5 cm.)
12. Try to apply some water to your field and watch to see that the water uniformly moistens the soil. (Adjust the channels to assist water flow.)
13. Plant some seeds in the ridges between the irrigation ditches. You may choose one row of oats - one of barley and one of wheat. If these are unavailable, lettuce and radish will work well too. Make sure that when the water is turned on to the field that it penetrates the soil but does not wash out the seeds.

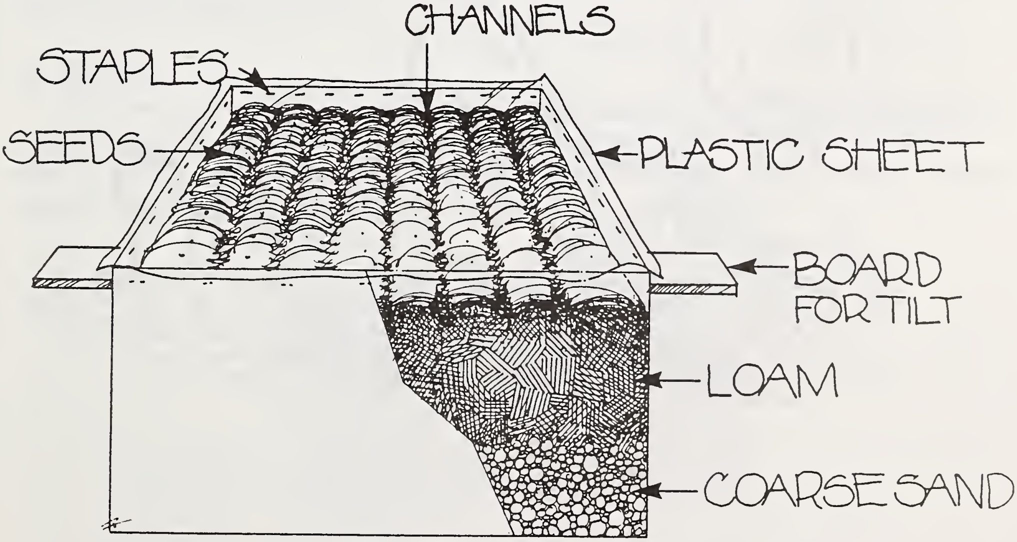
Part 4
Growing Tips

14. Make sure that the soil over the seeds is firmly packed down so that the seeds will remain moist through the germination stage. (The field may be covered with light plastic propped up on sticks so that it is not touching the soil. This will prevent drying. This green house cover should be removed and irrigation begun as required as soon as the seedlings appear.)
15. The best location for your crop field is in a cool sunny window. Plants grown in the dark may become weak and stunted.
16. Do not over water your crop. This may make the plants weak. Use a water meter used for potted plants to check the moisture at the root level of the plants.
17. You may wish to fertilize your crop. The application of 20-20-20 fertilizer in the recommended solution should be effective.

Part 5
Conclusion

18. Keep a record of the growth of the crop, the amount of water used and amount of end product. A wall chart may provide a good means of sharing this information with other student groups.

Additionally, students may prepare a brochure which advertizes the advantages of irrigation for intensive crop production.



TEACHER RESOURCE

Soil Test Experiment

Use several identical jars filled with different soils to help the students discover how their irrigation system will operate.

1. Put different soil mixtures in each jar and pack down quite firmly. (Label the jars.)

2. Add ¼ cup of water to each jar and measure how far the water penetrates the soil in each jar.

3. Rate the water movement in each of the samples. Students will notice that there is little penetration in a jar full of clay, while the sand lets the water go straight to the bottom. This is due to the size of the soil particles. Neither of these soil extremes would be ideal for their farm. Choose the soil best suited to their irrigation project.

4. Choose a soil that absorbs the moisture at a moderate rate while keeping a small amount on the surface. This will allow for even distribution along the irrigation ditches.

Agricultural Irrigation

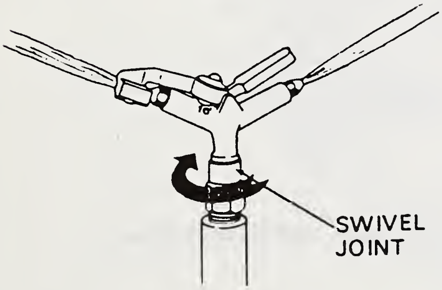
1. METHODS OF APPLYING WATER

There are four basic methods of applying water: (a) sprinkler, (b) surface, (c) trickle, and (d) below surface.

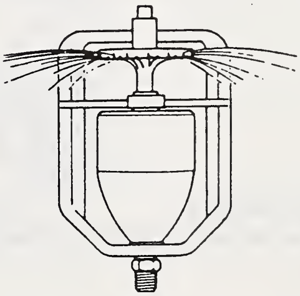
(a) Sprinkler

With the sprinkler method, water is sprayed through the air and it falls to the ground like rain. This is accomplished by using either one or more rotating sprinklers or spray nozzles. Perforated pipe may be used.

Rotating Sprinkler



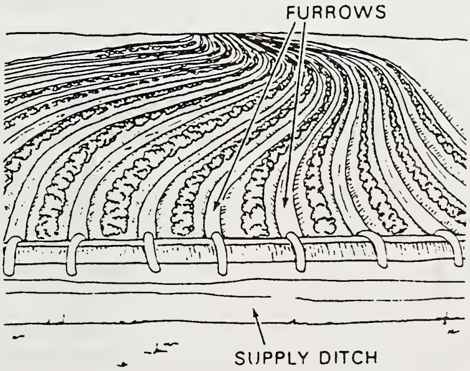
Spray Nozzle



With each method, the water is sprayed into the air, broken up into various size drops, and distributed over the ground.

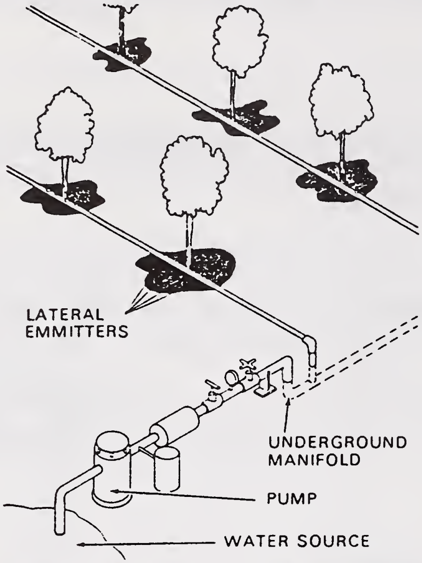
(b) Surface

With the surface method, water is applied on the ground at the ground level. It flows by gravity over the surface of the field. This is accomplished in two ways. For close-growing crops - ones that are sown, drilled or sodded - the entire field is flooded. For row crops in beds, the water is directed down furrows between the rows.



(c) Trickle

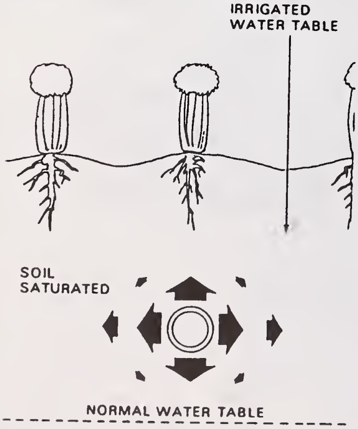
Trickle irrigation is a system for supplying filtered water directly onto or below the soil surface. Water is carried through an extensive pipe network to each plant. The outlet device that emits water onto or into the soil is called an "emitter". After leaving the emitter, water is distributed to a "wetted zone" by its normal movement through the soil.

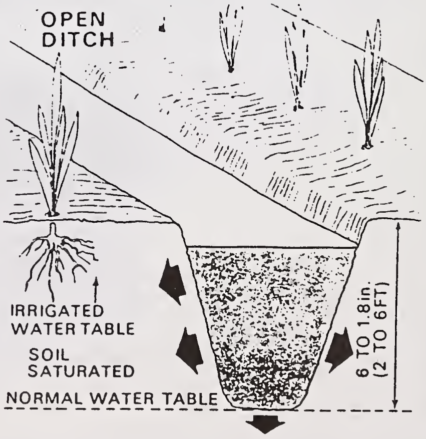


(d) Below Surface

Below surface irrigation is classified into (1) sub-irrigation, and (2) subsurface irrigation.

(1) Sub-irrigation. With the sub-irrigation method, water is supplied at the root zone by artificially regulating the groundwater table elevation. In sub-irrigation, check dams and gates are used to maintain the water level in the soil from open ditches or from jointed or perforated pipe. The water is held just below the root zone (30 to 91 centimeters or 12 to 36 inches).

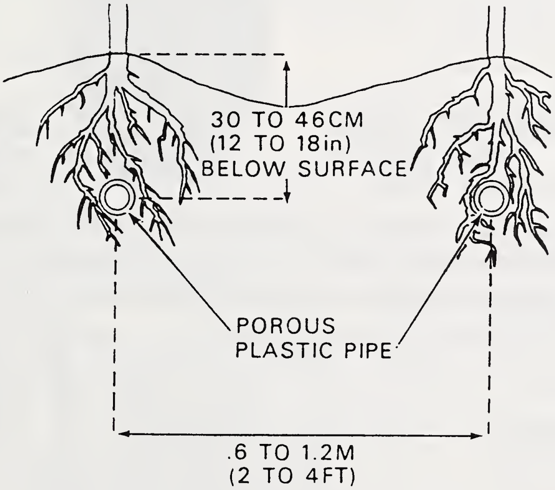




Water moves into the root zone by capillary action. Water moves from the surface of wet soil particles to drier soil particles because of surface attraction forces. This attraction may be upward, sideways or downwards depending on where the drier soil is located.

With deep-rooted crops such as citrus trees, the water level may be raised periodically to near the surface for irrigation. Then it is lowered to provide the root development.

(2) Sub-Surface. In sub-surface irrigation, water is applied below the surface by porous or perforated plastic pipe. This method of applying water is somewhat similar to trickle irrigation. Instead of the pipe being placed on top of the ground, it is "planted" under the row in the root zone.



2. EFFECT OF LAND SLOPE

The slope on your land may determine which method of irrigation you use. If your land is level, or it can be made level without too much expense, you can use any of the three methods you choose. If you have sloping land, you may be limited to using the sprinkler or trickle method.

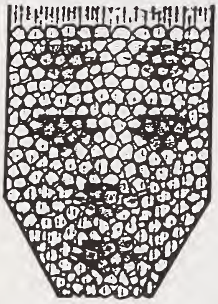
With the trickle method, emitter discharge rates can be matched to soil intake rates. Uniform pressure distribution can be obtained through pressure regulation and lateral arrangement.

Some types of surface systems can also be used on sloping land but most of these systems require land levelling or benching.

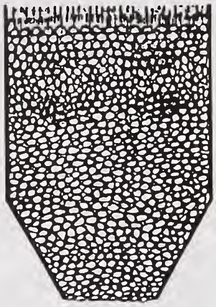
3. EFFECT OF WATER INTAKE RATE

You must know the water intake rate of your soil (how fast it can absorb water) to determine the maximum rate you can apply irrigation water so that surface puddling and run off will not occur.

Several conditions affect the intake of the soil. Two of the more important ones are texture (size of the soil particles) and surface sealing due to compaction and salts. The larger the soil particles and the farther apart they are, the faster the intake rate. In addition, slope crop cover and tillage conditions will also affect the water intake rate.

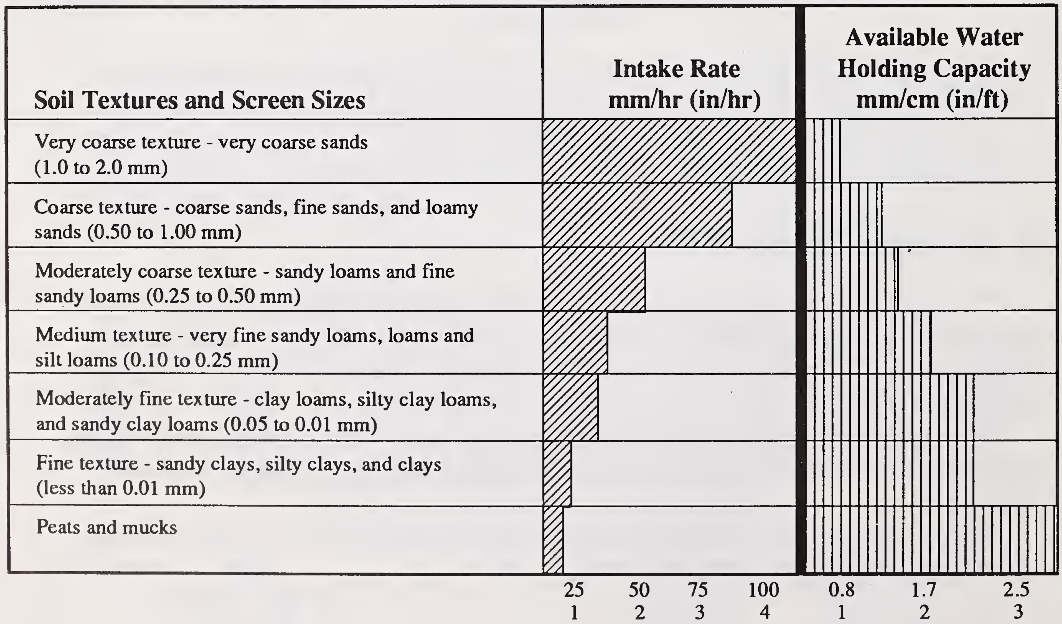


COARSE SOIL
HIGH WATER
INTAKE RATE



FINE SOIL
LOW WATER
INTAKE RATE

The water intake rate of your soil affects the method of irrigation you use. The following table gives the relative intake rates of soil with different textures. A more detailed classification is available from the Soil Conservation Service.



If your soil has a "low water intake rate" [13 millimetres (0.5 inches) per hour or less], you can use the sprinkler, surface or trickle method.

If your soil has a "low water intake rate" [76 millimetres (3.0 inches) per hour or more], you may be limited to the use of the sprinkler, trickle or subsurface method. With high intake rates, it is usually impractical to try to apply water by the surface method. You will have too much water absorbed at the head of the irrigated area and not enough delivered to the opposite or lower end. You can correct this condition by shortening the length of run. But you will reach a point when the length of run may be too short to be practical. Table IX shows how length of runs in the surface method may vary with different soils.

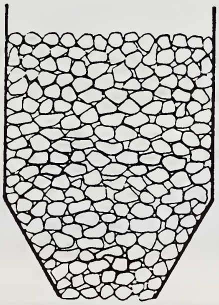
If your soil has a "moderate water intake rate" [13 to 76 millimetres (.5 to 3.0 inches) per hour], you can use any of the four methods. Your system must be designed to apply water according to the intake rate of your soil.

INTAKE RATES AND AVAILABLE WATER-HOLDING CAPACITIES OF SOILS WITH DIFFERENT TEXTURES

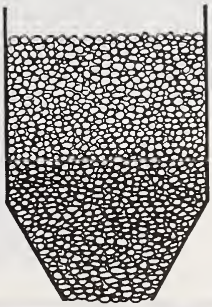
SOIL TEXTURES	LENGTH OF RUN Maximum Meters/(feet)
Very coarse texture very coarse sands	NOT SUITABLE
Coarse texture coarse sands, fine sands and loamy sands	183 (600)
Moderately coarse texture sandy loams and fine sandy loams	274 (900)
Medium texture very fine sandy loams, loams and silt loams	366 (1200)
Moderately fine texture clay loams, silty clay loams and sandy clay loams	549 (1800)
Fine texture sandy clays, silty clays and delays	792 (2600)
Peats and mucks	NOT SUITABLE

4. EFFECTS OF WATER-HOLDING CAPACITY

The "water-holding capacity" of soil is the amount of water it will hold after the free water has been drained away by gravity. The water- holding capacity of a soil depends largely on its texture. Soil texture affects water-holding capacity even more than it affects water intake rate.



COARSE TEXTURED SOIL
LOW WATER HOLDING CAPACITY



FINE TEXTURED SOIL
HIGH WATER HOLDING CAPACITY

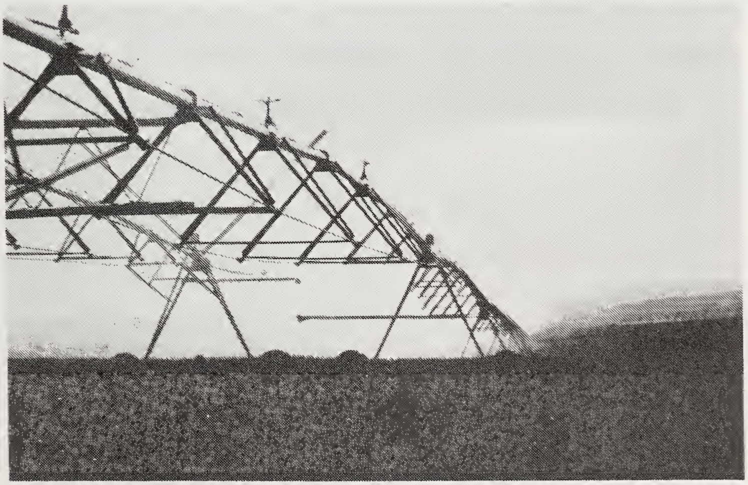
All the water a soil will hold is not equally available to plants. As the plant roots remove available water following an irrigation, the remaining water is bound more tightly to the soil; thus it is less available to the plants. Coarse-textured soils hold less water than fine-textured soils.

The water-holding capacity does not affect the method of irrigation. It does, however, determine the frequency of irrigation and the amount of water applied per irrigation. This means that if you have a coarse-textured soil, your irrigation system must be designed to apply water more frequently than if you have a fine-textured soil. You must be able to irrigate the entire field before the water content of the soil drops too low. Otherwise your crop may not reach its maximum production potential.

Source: Planning for an Irrigation System, United States Department of Agriculture

Irrigation ditch brings water to the field.

Many crops benefit from irrigation.



Sprinkler method.

Activity 14

LEARNING THE LANGUAGE

STUDY QUESTION: Why should I learn what the word fertilizer means if I live in the city?

THE ACTIVITY: Students build vocabulary by completing the Agricultural Crossword Puzzle.

CURRICULUM FIT:

LANGUAGE ARTS
- ● Building vocabulary

MAJOR CONCEPT
- ● Effective communication requires a good vocabulary.

LESSON CONCEPT
- ● The diversity of agriculture requires the use of specific terms which help us to communicate to others about the subject.

AGRICULTURE CONCEPTS: Diversity

PURPOSE:
- ○ To introduce students to some terms commonly used in agriculture.
- ○ To assist students in learning how to use and apply definition.

MATERIALS REQUIRED: Supplied in this lesson.

TIME REQUIRED: 2 - 3 class periods.

BACKGROUND - For the Teacher

This lesson can be used for self enrichment by students. The directions are simple, and since it is a familiar activity for students at this age, they should be able to complete it with little or no assistance from the instructor.

PROCEDURE

Part 1
Introduction

1. The first step in the study of any new subject is to become familiar with the associated vocabulary. This lesson provides a simple glossary of common agricultural terms. The students can test their understanding of agricultural terms by attempting to complete the crossword puzzle.

Part 2
Building Vocabulary

2. This lesson may be done one of two ways:
   a) Review the vocabulary provided and then test your knowledge of the terms by working on the crossword puzzle.
   b) Try to complete the crossword puzzle. Use the vocabulary definitions to assist you where required.

Part 3
Conclusion

3. Have the students choose three words that they have never seen before. They should try to use them in a sentence. This can be a written or an oral assignment.

FOR DISCUSSION

In a class discussion, consider the following:

1. How many of the students found this exercise a challenge?
2. What were the most common words?
3. Which words were generally unfamiliar?

RELATED ACTIVITIES

1. Have the students create illustrations for some of the terms in this vocabulary list.
2. Have a spelling bee using these words.
3. Find the words in this list that belong to main groups such as grains, names of animals, agricultural products.

STUDENT RESOURCE

LEARNING THE LANGUAGE

Vocabulary

Apiary	A place where beehives are kept.
Acre	A measure of land equal to 4,840 square yards or .405 hectares. Originally the area of land that could be ploughed in a day by a team of oxen.
Agriculture	The cultivation of the soil for the production of fruits, vegetables, seeds, grains, livestock, or forest products.
Apiculture	Beekeeping
Arable land	Land fit for tillage; Land ploughed or tilled at regular intervals.
Arid land	Dry land with limited rainfall. Often sparse of vegetation. Short grass - typically treeless.
Barley	A cereal grain used for stock feed, beer making and in soups.
Bedding	The litter for farm animals to sleep on, usually straw or shavings.
Beef	The meat from a bull, cow, steer or heifer.
Billy goat	A male goat.
Bran	The husks (outside) from ground grain which is high in fibre content. Wheat bran is a by-product of flour milling.
Brand	A mark burned onto an animal's hide by means of a hot branding iron for purposes of identification. A brand may also be produced by using a cold branding iron cooled in liquid nitrogen which causes a permanent change in hair color from dark to white .
Breaking	Ploughing uncultivated or new land as in "Breaking sod"; training a horse to work in harness or accept a rider and saddle.
Breed	A strain, race, variety or kind of plant or animal. Example: A Holstein is a breed of dairy cattle.

Vocabulary (cont'd)

Broiler	A chicken raised for the table under intensive conditions for 9 - 11 weeks. Weight 3.5 - 4 lb. (1.6 - 1.8 kg.)
Brooder	Unit containing a heat source where newly hatched chicks or baby pigs are kept.
Bushel	A measure of grain, containing 1.25 cu feet or 8 gallons. Many farmers still use this measure when relating to seeding or production.
Buttermilk	The liquid which remains when cream is churned to butter.
Calf	A baby cow or bull, very young cattle.
Cereals	Cultivated members of the grass family whose seeds are edible. These can be used to provide flour for bread making or as animal feed. Examples: Wheat & rye, bread, barley, oats, grain and corn.
Cheese	A nutritious food stuff; prepared from the curd of milk coagulated by rennet or acid, separated from the whey, and pressed into a solid mass.
Chick	A newly hatched young bird.
Clone	A group of plants or animals all having an identical genetical make up; the descendents of a single parent. Plants may be vegetatively raised by taking cuttings from a single parent plant.
Compost	A material derived from decomposed plant remains. This is usually made by fermenting waste plant material in heaps, but with adequate aeration. Lime, nitrogen and water may be added.
Conservation	The protection of a resource. For example: the protection of soil against erosion or loss of fertility.
Corral	An enclosure in which cattle or horses are kept.
Cow	The female of the bovine animals.
Decomposition	The breakdown of complex organic matter into simpler form through rotting and decay, usually in the presence of oxygen.
Dirty land	Usually refers to land infested with weeds.

Vocabulary (cont'd)

Drill	An implement used to place seeds in rows without plowing. A tool used to make holes in wood, metal, soil etc.
Drone	A male bee.
Embryo	Young animal or plant in its earliest stages of development after fertilization. Example: a young animal in it's mother's womb or a seed embryo. That portion of the seed which is capable of cell division.
Ewe	An adult female sheep.
Fallow	Land left unseeded for a season during which it is cultivated to kill perennial weeds. The practice of fallowing is no longer common in low moisture zones.
Feedlot	A small area of land where animals are fed in large numbers. Feed is brought into the feedlot from other areas.
Fertilizer	Anything added to the soil to increase the amount of plant nutrients available for plant growth. Includes: compost, manure, chemicals.
Fleece	A sheep's coat of wool.
Fodder	Feed supplied to livestock such as hay and straw.
Germination	The commencement of growth of a seed; Production of roots and shoots from the seed embryo.
Granary	A farm building for storing grain.
Graze	To eat or feed on growing grass and other pasture plants.
Harvest	The time when ripe or mature crops are cut and lifted, or picked and gathered.
Hay	Grass or legume plants conserved in dry form for animal feed. (Contrast to silage, which contains high moisture.)
Hectare	A metric unit of land measure equal to 10,000 square metres. 1 hectare = 2.47 acres.

Vocabulary (cont'd)

Honey	A thick sweet fluid prepared by worker bees from nectar collected from flowers.
Humus	Decomposed and partly decomposed organic matter in the soil derived from plant and animal residue.
Irrigation	The application of water to soil to provide an adequate supply for crop needs to increase crop yields.
Lactation	The period during which a female produces milk.
Lamb	A young sheep.
Land use	The main uses of land including agriculture, woodland, industrial, residential, recreation and transportation corridors.
Livestock	Domesticated animals such as cattle, horses, pigs, poultry, sheep, etc.
Manger	A trough in which feed for cattle or horses is placed.
Manure	Plant or animal waste products which are used as fertilizer.
Market garden	Land used to grow vegetables and fruit for sale for direct human consumption.
Milk	White liquid secreted by female mammals for nourishment of their young.
Milking parlour	A building containing specialized milking machines where dairy animals are milked. Cows are brought into the milking parlour for milking twice a day.
Mixed farm	A farm on which a range of activities including crop production and livestock keeping are practiced.
Oats	A cereal crop. A grain used for stock feeding or bread making and porridge.
Oilseed crops	Grown for the oil content of their seeds. Edible oil is used for the manufacture of margarine and cooking oil. The by-product, called oil cake meal, is rich in protein and used in animal feed.

Vocabulary (cont'd)

Orchard	An area of land used for growing fruit trees.
Ox	A term used for cattle when used for draft purposes. Example: pulling an ox-cart.
Parasite	An organism which lives in or on another organism from which it derives food and shelter. Includes internal worms and external flies or mosquitoes.
Pasture	An area of grassland used only for grazing.
Pesticides	Poisonous chemicals used to kill pests such as fungus, plants, insects and rodents.
Photosynthesis	Process by which green plants manufacture carbohydrates from water and carbon dioxide and store the energy from sunlight.
Piggery	A place where pigs are kept.
Plough	One of the oldest types of tillage implements which breaks up the land by turning over the soil into ridges and furrows.
Polled	A term used for animals which naturally lack horns. Example: a polled hereford.
Poultry	A term for domestic fowl kept for egg and/or meat production.
Reforestation	The planting of trees on land where a forest has previously stood, but has been destroyed.
Root crop	Plants grown for their edible swollen roots. Example: turnips, carrots and potatoes.
Ruminant	An animal which chews the cud and possesses a complex digestive system which allows it to digest grass, hay and straw.
Season	One of the four climatic divisions of the year. Example: Spring.
Seed bed	Land cultivated to a level fine tilth in which seeds are sown.
Shear	To cut or clip a fleece from a sheep.

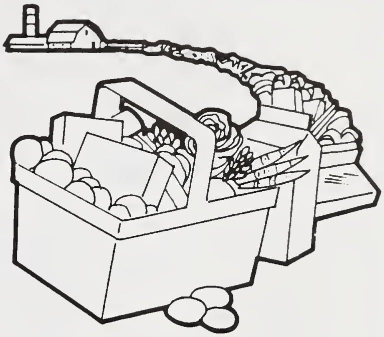
Vocabulary (cont'd)

Silage	A feeding stuff consisting of forage crops harvested in the green state and with sufficient moisture to ensure fermentation, in the absence of oxygen. The feed is partially fermented and stored in a silo.
Sire	Male parent of an animal.
Soil	The unconsolidated (loose) material covering the surface of the earth in which plants grow and in which many organisms live.
Sow	Adult female pig.
Spraying	Application of pesticides, fertilizers or seed to crop land. Ground spraying uses towed or self-propelled equipment. Aerial spraying uses an airplane or helicopter to dispense the product (granular or liquid form). Pesticides may also be applied to livestock.
Stubble	That part of a crop left on the ground after harvesting which includes roots and/or dry stalks.
Tillage	The process of preparing the land for planting. Includes such operations as ploughing, cultivating, discing etc.
Tilth	The condition of the top soil after tillage. A fine tilth consists of small clods.
Tractor	A vehicle for pulling farm implements and trailers.
Veterinarian	A person qualified in veterinary science, the study of animal diseases, who can diagnose diseases, prescribe medicines and perform surgery on animals.
Wean	To separate a young animal from its mother so that it no longer has access to its mother's milk and must rely on other foods.
Weeds	Plants growing where they are not wanted.
Wheat	Cereal grain used mainly for flour making (for bread or pasta).

Worksheet

Agricultural Crossword Puzzle Clues

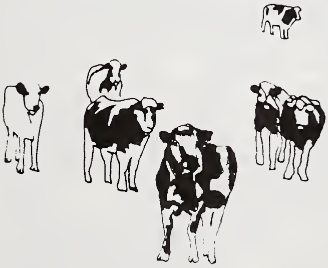
DOWN



1. *Newly hatched bird.*
2. *Farm vehicle used for pulling.*
3. *Measure of land area.*
4. *Condition of top soil.*
5. *Beekeeping.*
8. *Animal doctor.*
10. *By-product of making butter.*
14. *Male bee.*
15. *Plants manufacture food using this process.*
16. *Unborn animal.*
19. *Period of milk production of an animal.*
23. *Commencement of growth of a seed.*
25. *Father of an animal.*
26. *Partially fermented forage crops. Animal feed.*
27. *Young sheep.*
29. *To cut the wool from a sheep.*

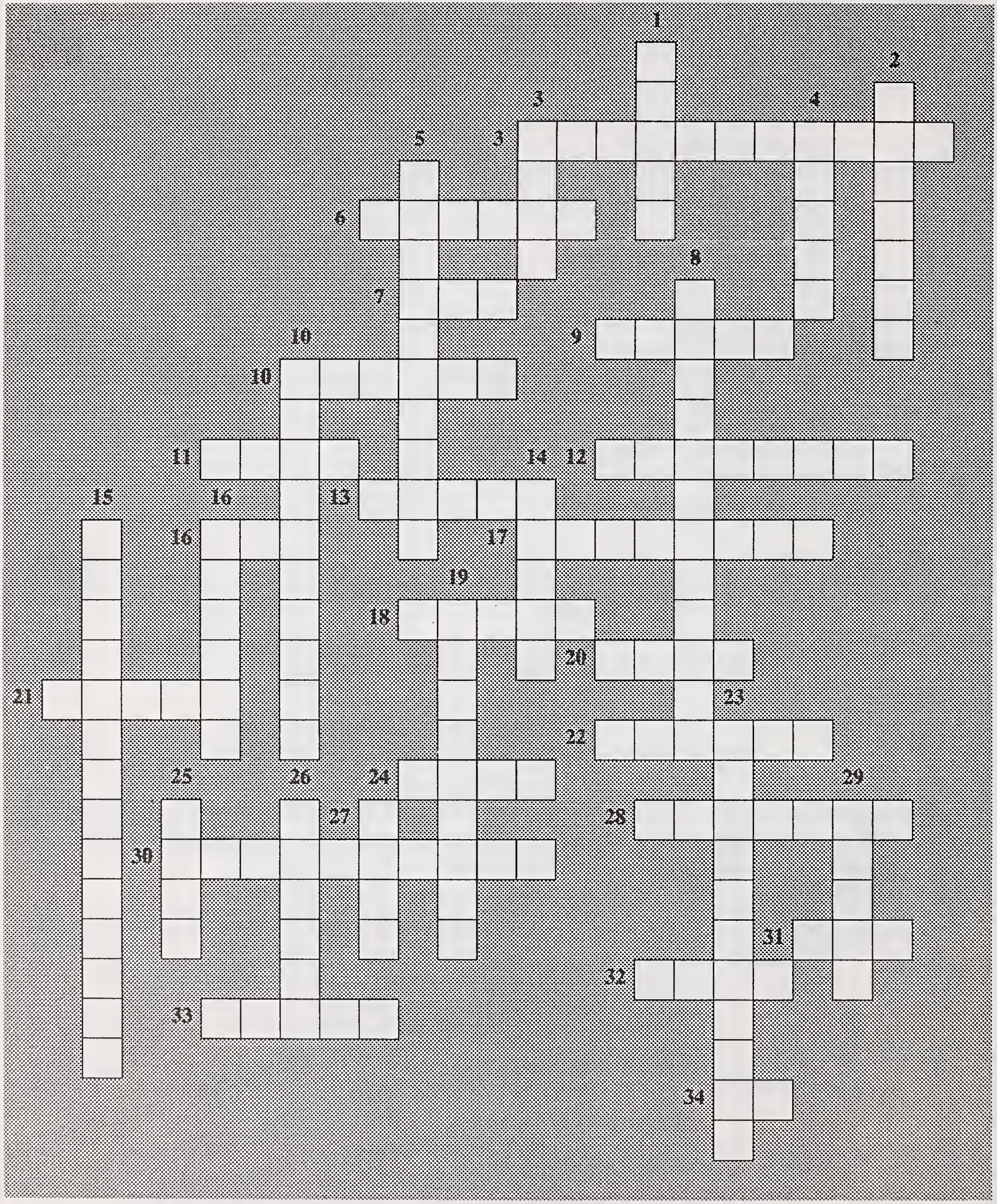
ACROSS

3. *The cultivation of land and production of food.*
6. *Place where beehives are kept.*
7. *Female bovine.*
9. *Cereal used for making bread flour.*
10. *Cereal used in beer making.*
11. *Cereal often fed to horses.*
12. *Organism living in or on a host animal.*
13. *Identification mark burned into an animals' hide.*
16. *Female sheep.*
17. *Animal which chews its cud.*
18. *A group of plants or animals having an identical genetic make up.*
20. *Plants grow in this material.*
21. *Sweet liquid made by bees.*
22. *Container for feed.*
24. *Baby cow or bull.*
28. *Time when ripe crops are cut and collected.*
30. *The application of water to soil.*
31. *Dried grass or legumes - animal food.*
32. *To remove the young animals from their mothers.*
33. *Plants that grow where they are not wanted.*
34. *Cattle used for draft purposes.*

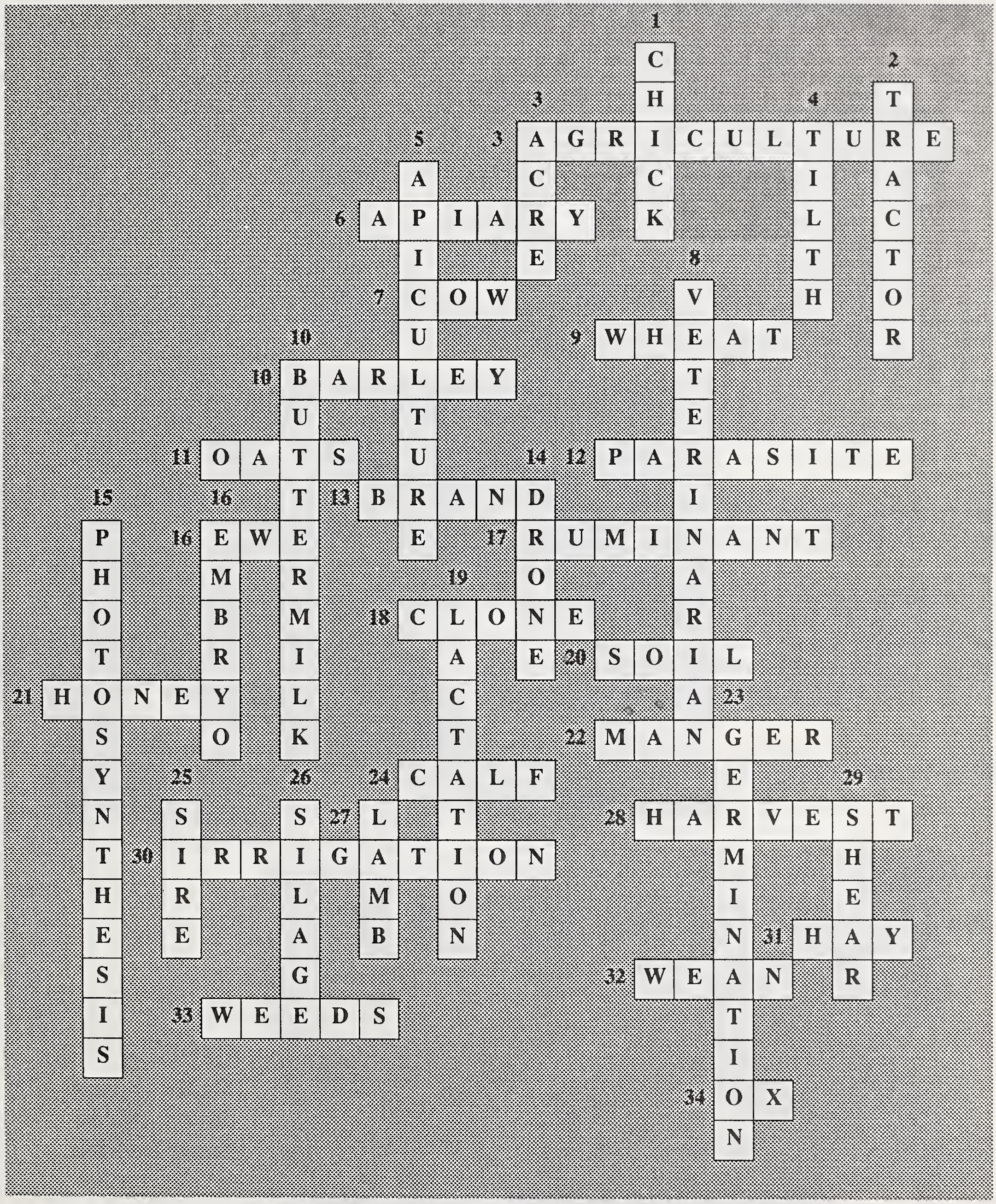


Agricultural Crossword Puzzle

Worksheet

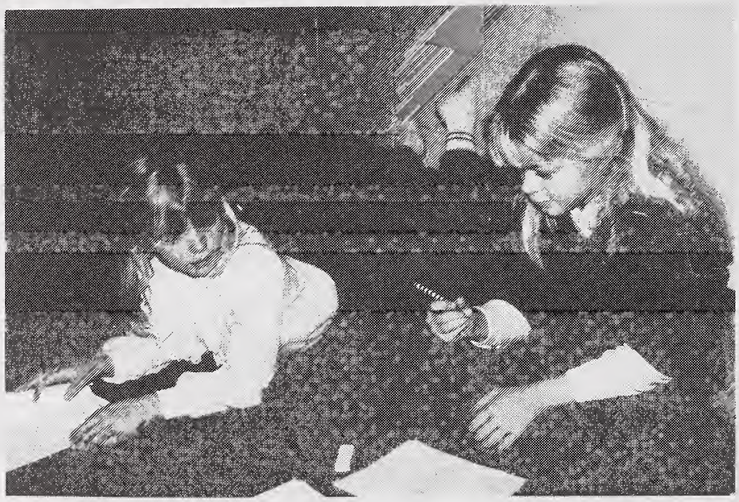


Crossword Puzzle - ANSWERS



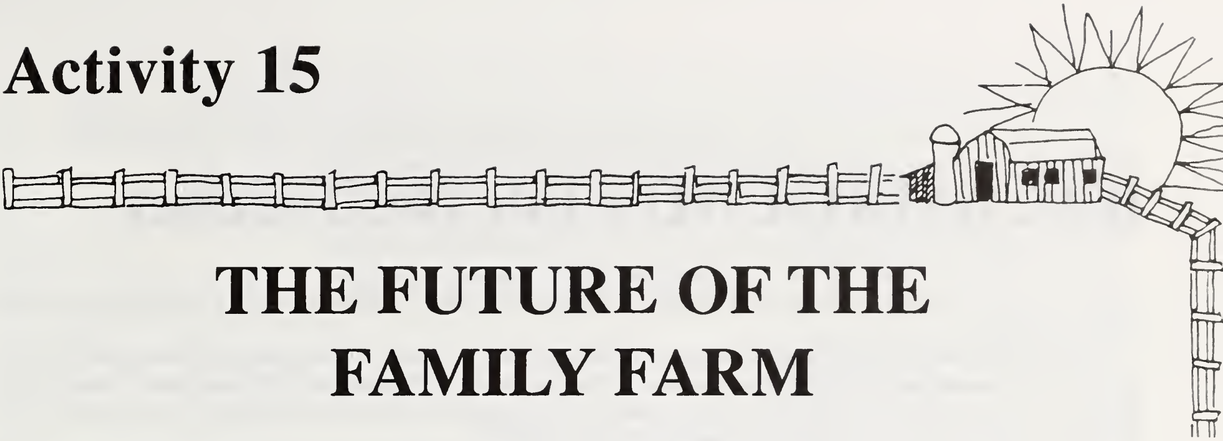
Students from Joe Clark School

working together to get it right.



Students proudly demonstrate the finished product.

Activity 15



THE FUTURE OF THE FAMILY FARM

STUDY QUESTION:	Why do the cities get larger and small communities smaller? Why do people move?
THE ACTIVITY:	Students role play a modern farm family dilemma.
CURRICULUM FIT:	**SOCIAL STUDIES** ● Alberta, Past, Present, Future: Change. **LANGUAGE ARTS** ● Development of speaking skills - expressing orally - explanations, preferences, feelings, judgements, emotions, or predictions. **MAJOR CONCEPT** ● The ability to express preferences, feelings, judgements, emotions and making predictions are important communication skills. **LESSON CONCEPT** ● By assuming the role of another person, we can better understand his/her feelings.
AGRICULTURE CONCEPTS:	Economic Importance Capital and Technology Intensive Nature of the Industry
PURPOSE:	○ To show that different people feel differently about the same event. ○ To express feelings and preferences orally. ○ To improve decision making skills.
MATERIALS REQUIRED:	Stage area (front of classroom). Entrance to the stage area. Table and chairs. Cups and tea service. Various other stage props such as drinks and costumes are optional to create an interesting farm setting.
TIME REQUIRED:	2 class periods.

BACKGROUND - For the Teacher

This is a role playing activity where children are asked to portray a situation involving a family dilemma which must be resolved.

In the early years of Alberta's settlement, much of the population was rural. The homesteads began as parcels of land consisting of a quarter section (160 acres). These were developed mainly as family farms. Thriving farmers bought more land as it became available in the district. The community provided support and social opportunities for it's members. The community activities were very important to farmers and their families.

Today most of Alberta's residents live in cities and towns. Many families have moved from the farm to take jobs in the cities. The farms are much larger than they were 50 - 80 years ago.

Some of the modern farms are owned by large corporations. Other farms are run on a cooperative basis. An example of a cooperative farm is a Hutterite Colony. This move towards larger farms and corporate holdings has resulted in sparse rural populations and reduced community activities. Many farming families are struggling to keep their communities alive during this transition.

Of course, there are a variety of opinions held regarding this shift from the small family farm to the larger operations. Often the people who are charged with making decisions find themselves in difficult positions. Many opinions are raised and quite a lot of pressure is applied by various interested parties.

PROCEDURE

Part 1

Preparation and Introduction

1. Introduce the lesson by discussing the transition from rural to urban living in Alberta.
   a. What does this mean to farmers?
   b. How would this affect a farming community?
      As the farms get larger, the neighbours become more distant and there are fewer people to share in the community.
   c. Do any of the students have something in their homes that belonged to their grandparents?
      Usually these things are treasured by the family. These things become traditions. Things we treasure from the past are important and we resist change.
2. Explain to the students that they are going to share in the decisions of a modern farming family forced to sell the farm.
3. Read the background of the dilemma to the class.
4. Ask for student volunteers to act out the dilemma. There are 8 men and 5 women characters. The balance of the class will be the audience.
   Members of the audience will be asked to decide what they would do in the same circumstances.
5. Make copies of the roles and give each volunteer character his or her role. Ask them to study them for a few minutes. They may wish to ask questions in order to clarify their roles.
6. Review all of the roles with the entire class.
7. The non-participating students can arrange the stage for the drama. There should be some kind of door to enter the kitchen. They may decide to make some sets, but these are not essential.

Part 2
The Dilemma

8. By the next class period, the stage should be ready.
9. Provide participants with a copy of the resource page which gives the order that the characters will arrive at the kitchen. If possible, have the characters wait outside the classroom so they will not be influenced by what happens before them. The characters should avoid discussing their views with each other before the role playing.
10. Invite the participants to begin the drama.

Part 3
Conclusion

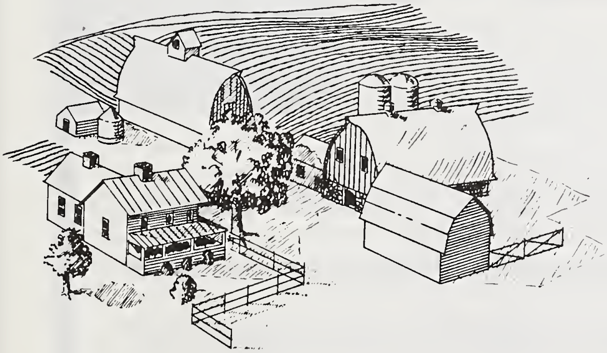
11. When Henry and Sally have made their decision, ask members of the audience to comment on their choice. How many would have made the same decision?

FOR DISCUSSION

1. Who presented the strongest argument?
2. What might happen if Henry and Sally decided to sell:
    a. through an agent?
    b. to the German Corporation?
    c. to the Hutterites?

RELATED ACTIVITIES

1. Choose a farming area and look at the county map to see who owns the land and how it is divided.



STUDENT RESOURCE

The Dilemma

Henry and Sally Johnston are farmers who have been living in the Josephberg area all of their lives. Henry's parents came to Canada in 1911 and homesteaded on his farm. Henry and his father worked hard at their business and bought three more quarter sections of land. Henry and Sally now own 4 quarter sections (one section) and have a very successful grain farm. Henry and his wife Sally are very well loved by their neighbours. They have been very active in the community.

Henry and Sally are now ready to retire. Their son Bill, is a veterinarian and lives in town. Bill is a bachelor. He does not want to farm, but he understands that his father and mother should soon retire from the business. The family decides that they must sell the farm. This is a very difficult decision because it has been in the family for so long.

The problems do not end here. What Henry and Sally must decide is who to sell the farm to. Many groups are putting pressure on Henry and Sally since they have strong opinions as to what they would like to see happen to the farm.

The Setting

The Johnston Kitchen

Order of events:

1. John and Peter from the Hutterite colony come to visit to make their offer. ***(exit)***
2. Bill comes to visit and brings Felix to discuss selling to the German corporation. ***(exit)***
3. Norman, Lester and Fred drop in and suggest that Henry hire a real estate agent and try to sell to a family. ***(exit)***
4. Nancy, Gwen, Lorna and Jane visit Sally to work on some sewing. They discuss the community and try to persuade Sally to ask Henry to hire an agent and sell to a family.
5. Henry, Sally and Bill have a meeting and decide the future of the farm.

Remember that the final decision will be made by Henry and Sally.

STUDENT RESOURCE

The Characters and Their Views

Henry
the farmer - has decided he must sell his farm. He values his friends in the community and plans to move into the town of Josephberg where he and his wife can continue to take part in community activities. Henry really hates to leave the farm.

Sally
the farm wife - has lived in the community all her life and has been an active participant in the farm business. She is very active in the community and belongs to an association to support farm families. She believes that farms are wonderful places for families to live and wants to find a family to buy the farm.

Bill
the son - is a bachelor. He is very interested in agriculture and has become a veterinarian. He lives in town because his hours are so variable that he would find living in the country very difficult. Bill has a client in the area who manages a large corporate farm which is owned by a Count in Germany. He feels his family should sell their land to the corporate farm. The price is good and he feels it would also be good for his business.

Felix
manager of the German corporate farm. Felix's boss has authorised him to offer to buy Henry's farm. He is offering a fair price and will buy the machinery as well. Felix wants an answer in the near future because his boss is coming for a visit from Germany in two months and the final arrangements could be made at that time.

He has asked Bill to talk to Henry and Sally on his behalf. He plans to pay them a visit even though he does not know them. He is not very active in the community.

John and Peter
senior members of the local Hutterite colony. The colony has been given the approval to expand. They are anxious to buy Henry's farm because they hold land next to it. The Hutterites are excellent farmers and will pay cash for the land. They have offered the best price for the land so far. The members of the Hutterite colony keep mostly to themselves. They do not participate in the community except to sell some of their produce at the local farmer's market.

Nancy, Gwen, Lorna and Jane
neighbours, and friends of Sally. These ladies would like Sally to suggest to Henry that he hire a real estate agent. They are worried that the community will not be active if the farmland is all bought out by large business. These neighbours meet with Sally for coffee and share their concerns and ideas with their friend.

Norman, Lester and Fred
neighbours who own family farms in the district. Due to several difficult years, these neighbours are not able to buy The Johnston farm, but they hope that the farm will be sold to a family, not to the corporation or the colony. These farmers are like Henry and Sally. They believe that family farms are good. The neighbours want Henry to advertise his farm and sell it to a family which would help to keep the community active.

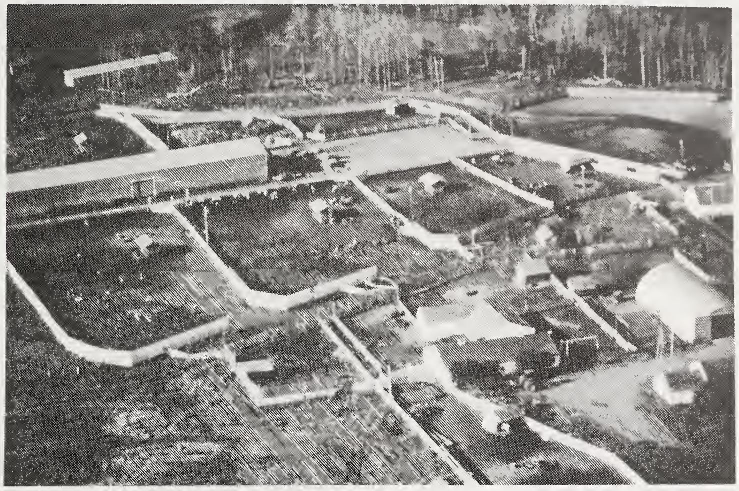
If Henry and Sally tried to sell their farm this way, they would have to hire a real estate agent and pay a fee.

TEACHER RESOURCE

Rural Population and Farm Sizes

(From Census Data)

	1976	1981	1986	1991
Total Population of province (thousands)	1,900	2,200	2,400	2,500
Population on farms (thousands)	219	195	N/A	184
Percentage rural	12	9	N/A	7
No. of farms (thousands)	61	58	58	57
Area farmed as a % of Alberta's total land area (159 million acres or 63.6 million hectares)	32	32	32	32
Average area per farm (ha)	331	348	358	364
Average area per farm (acres)	817	860	883	898



Some large farming operations are owned by corporations.

A family farm is a good place to live.

Activity 16

MATH TEASERS

STUDY QUESTION: Why do I have to learn math anyway? Show me some ways to use it.

THE ACTIVITY: Solving math problems related to agriculture.

CURRICULUM FIT:

MATHEMATICS
- Basic math skills and problem solving.

MAJOR CONCEPT
- Math skills are required in agribusiness.

LESSON CONCEPT
- Diversity of agriculture.

AGRICULTURE CONCEPTS:
Economic Importance
Production, Processing and Marketing Systems
Diversity

PURPOSE: ○ To make students aware of some facets of agribusiness through some simple math problems.

MATERIALS REQUIRED: Supplied in this lesson.

TIME REQUIRED: 15 - 20 minutes.

Math Teasers - Key

1. 120 bales
2. $12,000.00
3. $560.00
4. 1.5 hectares per hour
5. 12 tonnes per hectare
6. 242 tonnes

Math Teasers

1. A bale of hay weighs 25 kilos. Your new flatbed truck will hold 3 tonnes of hay. (A tonne is 1000 kilos.) How many bales will your truck carry?

   ____

2. Potatoes are selling for .12¢ a kilo. Your potatoes are in 40 kilo bags. You have harvested 2,500 bags. How much money will you receive for your potatoes?

   ____

3. The herbicide you bought cost $35.00 a litre and one litre will spray 1 hectare. What would it cost to spray 16 hectares?

   ____

4. Your new potato digger will dig 18 hectares of potatoes a day. If you work a 12 hour day, how many hectares an hour are you digging?

   ____

5. Your grain bin holds 300 tonnes of oats. This year you seeded 25 hectares to oats. You harvested enough oats to fill the bin. How many tonnes of oats did you harvest per hectare?

   ____

6. You have decided to diversify this year (plant three different kinds of grain), so you plant 20 hectares of oats, 35 hectares of barley and 60 hectares of wheat. If your wheat yield is 1.9 tonnes per hectare, your oats yield is 2.2 tonnes per hectare, and your barley yield is 2.4 tonnes per hectare, how may tonnes of grain will you harvest this year?

   ____

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